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THE WARSAW PACT BALTIC FLEET

by

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September 1984

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This thesis provides an examination of the threat posed to NATO by the Warsaw Pact Baltic Fleet and its capability to accomplish its maritime missions. The history of the Soviet Baltic Fleet is discussed in order to demonstrate previous Russian actions and interests in the Baltic region. The missions of the Warsaw Pact are delineated and supported by

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THE WARSAW PACT BALTIC FLEET

by

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Lieutenant Commander, United States Navy
B.S., University of Arizona, 1972

Submitted in partial fulfillment of the
requirements for the degree of

MASTER OF ARTS IN NATIONAL SECURITY AFFAIRS

from the

NAVAL POSTGRADUATE SCHOOL
September 1984

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This thesis provides an examination of the threat posed to NATO by the Warsaw Pact Baltic Fleet and its capability to accomplish its maritime missions. The history of the Soviet Baltic Fleet is discussed in order to demonstrate previous Russian actions and interests in the Baltic region. The missions of the Warsaw Pact are delineated and supported by evidence from Warsaw Pact exercises. The constraints caused by political and natural geography, oceanographic factors, and climate are reviewed. The character and types of operations necessitated by these constraints are proposed. The force structures of the Warsaw Pact nations (East Germany, Poland, and the Soviet Union) which make up the Warsaw Pact Baltic Fleet are examined. Trends in modernization and capabilities are discussed in particular depth. The navies of the NATO opposition (Denmark and West Germany) are presented in the same manner. The ability of the Warsaw Pact Baltic Fleet to accomplish its missions in the face of the constraints and opposition is analyzed.

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I. INTRODUCTION

The U.S. Department of Defense publication, Soviet Military Power, 3rd ed.,[1] makes the point quite clearly that the Warsaw Pact conventional forces have out numbered the NATO conventional forces since the inception of NATO. In order to create a credible deterrence to the superior forces of the Warsaw Pact, NATO's doctrine calls for a rapid escalation to nuclear warfare, including a first use policy in the event of a large scale Soviet attack.[2] It may now be necessary to modify or abandon this policy for two reasons. First, there is increasing evidence that the Soviet Union wishes to avoid using nuclear weapons as long as NATO does not use such weapons.[3] Second, since the Soviet Union has reached or surpassed parity in tactical nuclear weapons, it is unlikely that NATO would gain directly from any such escalation.[4] It may now be necessary for NATO to strengthen its conventional forces, in order to maintain a credible deterrent, reserving nuclear forces to the role of deterring a strategic nuclear attack. In order to prepare for such a radical change in NATO's doctrine, a clear understanding of the Warsaw Pact conventional threat, its missions, and capabilities is required.

While much has been written about the Mediterranean and the soft under-belly of Europe, little attention has been

paid to the threat on the other flank of NATO, the Baltic Sea. The importance of the Warsaw Pact Baltic Fleet in the event of war in NATO's central and northern theaters cannot be overstated. Whether the Warsaw Pact Baltic Fleet is allowed to join with the Soviet Northern Fleet or is "bottled up" in the Baltic, NATO operations will be directly affected. NATO and Western Europe must beware of and understand this threat to their security and be prepared to counter it or one day the choice may be risking nuclear war or surrendering a portion of Western Europe to Soviet domination.

Until 1970 the Soviet Navy's Baltic Red Banner Fleet constituted the main part of the Soviet Navy. The shift in emphasis to worldwide operational areas and a more offensive global strategy has been reflected in the change in the missions, makeup, and size of the Baltic Red Banner Fleet which today ranks third after the Northern Fleet and Pacific Fleet.

The Baltic Fleet has undergone a reduction in available ships and has received only a small share of new surface ship construction. At present the Soviet Baltic Fleet is made up of 107,000 men, naval air with 275 aircraft including ASW, and utility aircraft as well as ships. Available large ships include two large ASW ships, one gun equipped cruiser, seven guided-missile destroyers, five older destroyers, twenty-seven frigates, and thirty-two submarines including six Golf SSB's.[5]

This does not mean that the Soviet Union is ignoring the Baltic Sea or its ambitions there. Early in 1983, the Pacific Defense Reporter reported that the Soviet Union was expanding its naval base at Liepaja, Latvia. The reports further stated that the largest fishing collective in the Baltic was relocated to Ventspils, in order to make room for the naval base and that military convoys delivered large amounts of electronics and naval building equipment for the construction of what will become the largest, most modern Soviet base in the Baltic.[6]

Liepaja is, of course, only one of many Soviet bases on the Baltic Sea. Leningrad is the historical home of the Russian Navy, and today Leningrad may still be accurately called a "navy city". For the Soviet Navy, Leningrad is the most important base for education, design, shipbuilding and repair. It contains several of the Soviet Navy's "higher navy schools" including the M. V. Frunze Higher Naval School.[7] (See Appendix A for a list of Soviet Higher Naval Schools.) Of the twenty major Soviet shipyards, six are located at Leningrad--Admiralty Shipyard, the Baltic Shipyard, Kanonerskiy Shipyard, the Petrovskiy Shipyard, the Sudomekh Shipyard, and the Zhilanov Shipyard. Some fifteen miles to the west in the Gulf of Finland is Kotlin Island where the Kronstadt Naval Base is located as well as the Naval ship-repair yard and a commercial port. The commander in chief of the Soviet Baltic Red Banner Fleet has his

headquarters in Kaliningrad which is also a commercial port and contains a major shipyard. The naval base at Kaliningrad has extensive replenishment depots to supply ocean-going task forces, but the tenders and replenishment ships are frequently employed on missions far outside of the Baltic including the Indian Ocean. (See Appendix B for a brief description of other Port Cities--Lomonosov, Tallin, Riga, Ventspils, Klaipeda, and Baltiysk.)

The Baltic Sea is the most efficient supply route for the Soviet Union. The Soviet Union is dependent upon the Baltic Sea for COMECON, East-West, and third world trade. Much of the Soviet Union's import and export trade including its growing petroleum exports pass through the Baltic. The Danish Straits are transited 60,000 to 90,000 times annually by ships of all nations; one-sixth of the total vessel traffic is heading to or from Warsaw Pact nations. Forty to fifty percent of the entire Soviet merchant marine is registered at Baltic ports, and more than 25 percent of the Soviet fishing fleet operates out of the Baltic Sea.[7]

In any prolonged conflict in which the Soviet Navy is involved, ships will require access to the extensive repair yards along the Baltic coast. At the various naval bases along the East German, Polish, and Russian coasts is located more than half of the Warsaw Pact ship-building and repair capacity.[8] Not only the Warsaw Pact Baltic Fleet but also the Northern Fleet must have access to these facilities.

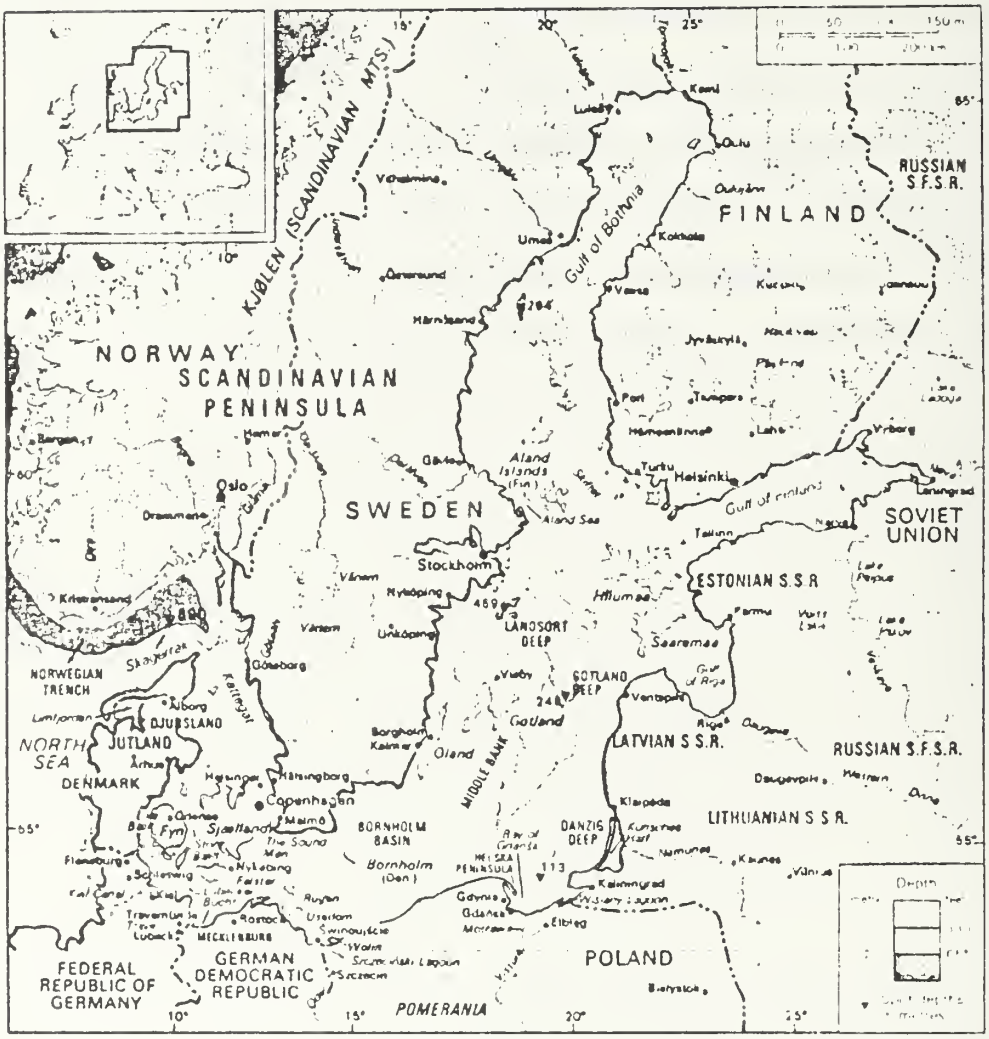
The vulnerability of having to depend upon the Baltic was amply demonstrated to the Soviet Union in both World Wars and was certainly a major factor in basing the largest fleet of the Soviet Navy on the Kola Peninsula. The Northern Fleet is the only one which can enter a major ocean without first passing through choke points at the Danish Straits, Dardanelles, or Japanese Archipelago. The Baltic Fleet must transit the Danish Straits; the Black Sea Fleet, the Dardanelles but also the Straits of Gibraltar; and the Pacific Fleet, the Japanese Archipelago. However, as has already been stated, the Northern Fleet is still dependent upon the repair facilities in the Baltic. The Soviet Union fully recognizes the need to control the Danish Straits--to allow the Baltic and Northern Fleets to merge while cutting off Norway from the rest of NATO; and at the same time, protecting the northern flank of the Soviet ground forces during an offensive in Europe by practically guaranteeing Soviet control of the Baltic.

The Soviet Union thus has a large stake in the Baltic Sea, both commercially and militarily. The critical threat which the Warsaw Pact Baltic Fleet presents to NATO will be examined in this thesis. First, the Russian historical presence in the Baltic since the founding of St. Petersburg by Peter the Great in 1703 will be examined. Second, the missions of the Warsaw Pact Baltic Fleet will be defined and verified through an examination of Warsaw Pact exercises.

Third, the political and physical constraints on operations in the Baltic will be discussed. Fourth, the force structures of the Warsaw Pact Baltic Fleet and its NATO opposition will be presented in order to determine Warsaw Pact and NATO naval capabilities in the Baltic region. Last, the capability of the Warsaw Pact Baltic Fleet to accomplish its missions in spite of the constraints on Baltic operations and NATO's opposition will be presented. (As a reference, a Map of the Baltic Region is included. See Figure 1.)

FIGURE 1

MAP OF THE BALTIC REGION



Source: Encyclopedia Britanica Macropedia, 15 ed. (1974). vol. 2, p. 668.

FOOTNOTES

[1]U. S. Department of Defense, Department of the Navy, Soviet Military Power, 3rd ed. (Washington D. C.: U. S. Government Printing Office, 1983).

[2]Norman Friedman, "West European and NATO Navies, "U. S. Naval Institute Proceedings, March 1984, p. 35.

[3]Ibid.

[4]Ibid.

[5]John Moore, ed. Jane's Fighting Ships 1983-1984. (London: Jane's Publishing Company, Ltd., 1983), p. 486.

[6]Dora Alves, "Defending the Baltic," Pacific Defense Reporter, July 1983, p. 50.

[7]Norman Polmar, Guide to the Soviet Navy (Annapolis: Naval Institute Press, 1983), p.24.

[8]"Danish Security Policy," NATO Review, October 1976, p. 4.

[9]Ibid., p. 4.

II. THE HISTORY OF THE BALTIC FLEET

Imperial Russia's maritime interest in the Baltic region is both long and colorful. Since Peter the Great created his "window on the West" in 1703 at St. Petersburg, there has been a Russian Baltic Fleet. The effectiveness of the fleet directly related the amount of Czarist's interest in the fleet. With the 1917 revolution, the remnants of the Czarist navy were integrated into the Bolsheviks state and military system. However, because of the government's distrust of the Navy after the revolt and perhaps because of a lack of appreciation for the potential of sea power, the fleet was reduced in size and effectiveness. From the 1920's onward the use of sea power has been fully recognized by the Soviet leadership. The history of this fleet gives some insight into the maritime and historical traditions of the Russian Baltic Fleet and must be remembered when considering the present Warsaw Pact Baltic Fleet's capabilities and missions.

A. The Russian Navy

In 1700 Russia had no access to the Baltic Sea and no ships on the Baltic. By 1729 at the end of the war with Sweden, Peter the Great had established his new capitol on the Baltic, and Russia had become a major naval power in the area.

The first ships of the Baltic Fleet were small galleys transported overland from the White Sea to Lake Ladoga where they fought a number of successful engagements against the Swedes culminating in the capture of Notenberg, now Petrokrepost, on 12 November 1702. Early in 1703 access to the Baltic Sea was secured with the seizure of the Swedish fortress, Nyenskans at the mouth of the Neva River, and the island of Kotlin, fifteen miles out in the Gulf of Finland. By the end of 1703 the building of St. Petersburg had begun at Nyenskans and the fortress of Kronslot (Kronstadt) was being constructed on Kotlin Island.[1]

In 1703 the Admiralty Shipyard was founded in Petersburg, and the serious building of a major Russian sailing fleet in the Baltic began.[2] In 1715 the Baltic galley fleet under Apraksin won its first major victory over the Swedes off Hango Head (Gangut). The first victory of Russian ships of the line followed in 1718 off Osel Island. At the end of the Great Northern War in 1721, the Russian Fleet was the most powerful in the Baltic.

The greatest difficulty confronting the fleet was the lack of native sailing skills, both above and below decks. In 1701 a naval school had been established in Moscow, and this institution was moved to St. Petersburg in 1715.[3] Nevertheless, the Russian Baltic Fleet remained heavily dependent upon foreign commanders for a century (e.g., Kruse, Gordon, Keith, Elphinstone, Grieg, and Jones). At times

foreign commanders impaired the effectiveness of the fleet. For example, in 1780 the Baltic Fleet, commanded largely by British officers, could not be relied upon to enforce the Armed Neutrality against Britain. From the very beginning, some Russians (e.g., Admiral Apraksin) did show a remarkable aptitude for naval command, and before long Russian naval dynasties emerged (such as the Seniavins).

After the death of Peter the Great in 1725, the Baltic Fleet was allowed to deteriorate. Empress Elizabeth (1741-1762) tried to reverse this decline by laying down new ships and sending squadrons to sea for training; but the battle effectiveness of the Baltic Fleet was reduced in the Seven Years War by having being entirely subordinate to the army. The Baltic Fleet next played a major role in Russian strategy during the reign of Catherine II (1762-96), who embarked upon an ambitious ship-building program. Though herself somewhat skeptical of the success of this program--"We have too many ships and men, but we have neither a Navy nor sailors,"--she allowed herself to be persuaded by Grigoriy Orlov to commit the Fleet against the Turks in the Mediterranean. Two squadrons sailed from the Baltic with considerable British help both in officers (notably Admiral Elphinstone) and in dockyard facilities. The united force of thirty ships under the command of Admiral Orlov defeated the Turkish Fleet of seventy-three ships at Chesme on 5 July 1770, a victory considered by historians to be one of the

most glorious in the history of the Baltic Fleet. But Admiral Orlov failed to follow up the victory with any decisive fleet action, and the role of the Baltic Fleet in the remainder of the war was minor.[4]

In 1788 Russia was again at war with Sweden. The war opened with a series inconclusive engagements at Hogeland in 1788 and Rochensalm in 1789. But in 1790 the Baltic Fleet defeated the Swedes off of Reval (13 May) and off Vyborg (3 July); although the Swedish Fleet did manage to escape. Even though the Swedes won the last naval engagement of the war (the second Battle of Svenskund on 9 July 1790), the Russian Baltic Fleet had won the war at sea. They had effectively prevented the Swedes from retaking the Russian Baltic coastline and emerged from the war as, once more, the largest fleet in the Baltic Sea.[5]

After the death of Catherine II, the Baltic Fleet once more declined especially during the reign of Emperor Alexander I (1801-1825). A government committee established in 1802 found the Fleet incapable of defending Kronstadt or St. Petersburg. Nevertheless a squadron of the Baltic Fleet under Admiral Seniavin distinguished itself in the Mediterranean against the Turks at the battle of Athos on 30 June 1807. During the campaign of 1812, the Baltic Fleet played an important role in denying Napoleon the Dvina River as a supply route for his troops. This also was a period when the Baltic Fleet performed important tasks in peacetime.

In 1803, the "Nadezhda", under I.L. Kruzhenstern, and the "Neva", under Yu. F. Lisianskiy, circumnavigated the globe while conducting research in oceanography and ethnography. In 1819 F.F. Bellingshausen in command of the "Vostok" and M.P. Lazarev in command of the "Mirnyi" explored the Antarctic and established the Russian claim for discovering Antarctica. Others explored the north Siberian and Pacific coasts of Russia. Such work, however, was contrary to naval tradition and ethos of the times. Explorers met with opposition from colleges and ministries alike.[6]

Under Emperor Nicholas I (1825-1855), interest in the Fleet revived somewhat. In 1827 a squadron of the Baltic Fleet under Admiral L.P.Geiden fought alongside the British and French at Navarino. The ship "Azov," commanded by M.P.Lazarev, particularly distinguishing itself during the battle. As a result of the victory Nicholas I decreed that from then on the Fleet would always contain a ship named "Pamiat' Azova" (Memory of the Azov). But Nicholas' interest in the Fleet was more as a showpiece than as a fighting force. This, combined with the changeover to steam, led to further decline. In 1854 an imperial committee declared that the Baltic Fleet was no longer a fighting force, and it played no significant role in the Crimean War.

After the Crimean War, when Russian ships were forbidden on the Black Sea, the Baltic Fleet assumed great national importance. Although expenditure on the Fleet was reduced by

Alexander II (1855-1881), his brother, Grand Prince Konstantin who was himself an ex-sailor and now Minister of Maritime Affairs, raised the Fleet to third in the world. In 1861 Russia built its first ironclad, the "Oryt", and in 1869 its first turret ship, the "Petr Velikiy". Alexander III (1881-1894) and Nicholas II (1894-1917) both spent large sums of money in building a new armored Baltic Fleet. This was done with the idea of utilizing the Fleet primarily as a showpiece. While large amounts of money were spent on the construction of new ships, little emphasis was placed on the training of crews. The ships remained in port for most of the year with the result that their crews remained ineffective as sailors but were open to political disaffection.[7]

This poor state of readiness was demonstrated during the Russo-Japanese War of 1904-1905, when two Baltic squadrons under Admiral Z. P. Rozhdestvenskiy, that had sailed to the Pacific to take part in the war, were sunk by the Japanese under Admiral Togo in the Battle of Tsushima (27 May 1905). The Baltic Fleet was virtually destroyed. Later in that same year and again in 1906, the Kronstadt sailors mutinied.[8]

The rebuilding of the Baltic Fleet began in 1909 with the laying down of four new battleships. This was followed by other ambitious building programs in 1911, 1912, and 1914. But except for the four ships begun in 1909 and one new destroyer, none of these ships were ready in time for the

First World War. The Baltic Fleet entered the war severely depleted, with the training of its men having suffered even more than normally.[9]

The naval war in the Baltic from 1914 to 1917 was fought mainly by small boats--minelayers, minesweepers, destroyers, and submarines. The Baltic Fleet distinguished itself in minelaying. The large battleships and cruisers saw little action and spent most of the war in port. The low morale of these ships in Helsingfors (Helsinki) and of the sailors in the rear base of Kronstadt contrasted with the high morale on the ships based at Reval (Tallin). In 1915 the crew of the battleship, "Gangut" mutinied, and it was in Kronstadt and Helsingfors that the bloodiest events of the February Revolution of 1917 took place. Throughout 1917 this division persisted with Kronstadt rejecting the Provisional Government as early as May and Helsingfors serving as the site of the Central Committee of the Baltic Fleet, with both bases sending contingents to fight in the October Revolution. Reval remained loyal to the Provisional Government possibly due in part to its higher morale.[10]

B. THE SOVIET NAVY

In February 1918, Admiral A.M. Shchastnyi withdrew all ships from Reval and Helsingfors to prevent capture by the Germans. Then, he withdrew the entire Fleet through the ice to Kronstadt, a passage normally considered unnavigable at

that time of year, thereby saving the Baltic Fleet for the new Soviet government. On his arrival in Petrograd he was shot by the Cheka for anti-Soviet propaganda, and the Reval Mines Division was disbanded as unreliable. The Baltic Fleet played little part in the Civil War as a naval contingent but the men were utilized as soldiers on land. Although the Kronstadt and Helsingfors sailors had been in favor of the revolution in 1917 and the Civil War, at no time had the majority supported the Bolsheviks.[11] In March of 1921, dissatisfied with the Soviet regime, the sailors rose in the Kronstadt Mutiny which was suppressed only after bitter fighting.[12]

In the 1920's the Baltic Fleet was reduced to a small coastal defense force. This resulted from 1) distrust aroused by memories of the Kronstadt Mutiny; 2) the new regime's lack of funds; 3) the loss of all bases except Kronstadt; 4) the "new school" of naval strategy, which favored a defensive fleet with a preponderance of submarines. In the early 1930's Stalin began to revise this policy, favoring plans for a large, balanced fleet of large and small ships. These plans were frustrated by 1) the effects of the purges, which removed many experienced officers, including the Baltic Fleet commander, Admiral A.K. Sivkov; 2) the inability of the Soviet Union to buy or build battleships; and 3) by the German advance to Leningrad which took from the

Soviet Union all of the bases it had gained through the Nazi-Soviet Pact of 1939.[13]

Once again the Baltic Fleet played a minor role in a major war, the Great Patriotic War. In 1941 the Soviet's ships delayed the German advance by contributing to the defense of Libau, Riga, and Tallin. But for the remainder of the war, these ships were bottled up between Kronstadt and Leningrad, held in by the ice in winter and German minefields in summer. In 1942 a few Soviet submarines managed to break through the minefields and harass German shipping, but in 1943 the Germans managed to stop even this.[14]

After the war, the Baltic Fleet found itself in a much improved strategic position--having regained its bases along the southern shores of the Baltic and having acquired, in former East Prussia, new ice-free bases, Kaliningrad and Baltiysk.[15] After a lull immediately following the war, the building of a large ocean-going fleet was resumed. On Stalin's death in 1953, the "new school" reasserted itself under N. S. Krushchev. Krushchev's desire to cut defense expenditures and to rely exclusively upon a nuclear deterrent meant a reversal in the Baltic Fleet to the policy of a small coastal defense force with a predominance of submarines.[16] In 1964 Krushchev appointed Admiral S.G. Gorshkov as the head of the Soviet Navy and he was able minimize the effect on the fleets.

The Cuban Missile Crisis of 1962 convinced many Soviet leaders that Soviet foreign policy unsupported by a conventional capability was extremely vulnerable. The strategy of a small coastal fleet was overthrown with Krushchev and since then the Soviet Union has built a large, flexible navy. With the emphasis on a "blue water" navy with a world wide presence capability, the Northern and Pacific Fleets have increased in size much more rapidly than the Baltic Fleet. The Baltic Fleet has been reduced in size, notably in the number of submarines--new units were not added as older units were retired. At the same time the Baltic Fleet has retained and increased its minelaying and coastal warfare capabilities in order to ensure the fulfillment of its assigned wartime missions.[17]

It has often been said that Russia is a continental power. While this is certainly true it does not imply that it must, therefore, have a weak maritime capability. While this capability varied widely over time, Russia has for the last 280 years had one of the largest navies in the world and for a large portion of that time, that navy was the Baltic Fleet. The Baltic Fleet has been and is an integral tool of Russian military power. Now that the Baltic Fleet has been historically examined, the next chapter will focus on the current maritime missions of the Fleet.

FOOTNOTES

[1]Donald W. Mitchell, A History of Russian and Soviet Sea Power (New York: Macmillan Publishing Company, 1974), pp. 22-24.

[2]Ibid., p.32.

[3]Ibid., pp. 29-30.

[4]Robert W. Daly, "Russia's Ancient Ally: The Sea," U.S. Naval Institute Proceedings, August 1972, p.62.

[5]M. G. Saunders, ed., The Soviet Navy (New York: Frederick A. Praeger, Inc., 1958), p. 31.

[6]Daly, "Russia's Ancient Ally: The Sea," p. 65.

[7]Mitchell, A History of Russian and Soviet Sea Power, pp. 188-203.

[8]Ibid., pp. 263-266.

[9]Ibid., pp. 267-268.

[10]Ibid., pp. 326 - 335.

[11]Ibid.

[12]Saunders, ed., The Soviet Navy, p. 91.

[13]Erwin M. Rau, "Russia and the Baltic Sea 1920-1970," Naval War College Review, September 1970, pp. 23-24.

[14]David Fairhill, Russian Sea Power (Boston: Gambit, Inc., 1971), p. 181.

[15]William G. Bray, Russian Frontiers--From Muscovy to Krushchev (Indianapolis: Bobs-Merrill Company, Inc., 1963), pp. 172-180.

[16]Mitchell, A History of Russian and Soviet Sea Power, p. 512.

[17]Ibid., p. 520.

III. THE MISSIONS OF THE SOVIET BALTIC FLEET

The missions of the Baltic Fleet do not stand alone but are a part of the overall military strategy of the Soviet Union. This strategy is based upon the concept of combined arms, where the missions of the Fleet are but a part of the entire overall "grand strategy" which combines the operations of land and oceanic theaters.

Understanding Soviet operations requires a much broader recognition of Soviet military strategy. The following is a brief description of how the Baltic Fleet fits into the unified military strategy. One or more areas of conflict are grouped together for command and control purposes into a theater of operations (TVD). The Baltic Sea is part of the Western theater of operations which includes three continental TVDs, Northwestern, Western, and Southwestern, and two maritime, Arctic and Atlantic. The Baltic Sea Fleet is utilized in the supports of the Western and Northwestern continental TVDs and the Atlantic maritime TVD. John Erickson has explained this method of organization and postulated the existence of a Northern TVD.[1] This organizational concept enables military planners to formulate optional military strategy and tactic to achieve objectives within their prescribed theater while taking into account the

numbers and capabilities of the forces at their disposal. Such an entity would logically include not only the armed forces but also such diverse organization as KGB border troops, MVD internal security troops, Civil Defense troops, and air formations.[2]

The Baltic Fleet has four primary missions which can be identified. These missions are interconnected with each other and with other Soviet commands in Europe. The four missions are 1. the control of the Baltic Sea, 2. the control of the Danish Straits, 3. the supporting of Soviet ground force operations, and 4. the supporting of Soviet Northern Fleet operations. Each of their missions will now be examined individually.

A. THE CONTROL OF THE BALTIC SEA

The Control of the Baltic Sea has been a principal mission of the Baltic Fleet ever since Peter the Great opened his "window on the West" in 1708. Today, the Warsaw Pact combined Baltic Fleet is clearly the most powerful naval force in the Baltic. The military usage of these assets may be contested by the forces of NATO and Sweden if adequate attention is paid to the enhancement of NATO's conventional capabilities.[3] The threat presented by the NATO forces to Soviet power and security are fully recognized and addressed on a continuing basis by the Soviet leadership.[4]

The control of the Baltic Sea includes the task of defending and protecting littoral areas occupied by the nations of the Warsaw Pact and most especially, the Soviet homeland. This requires a defense in depth involving land, sea, and air forces. A centrally coordinated, extensive intelligence collection is also required. The westward movement (prepositioning) of the Baltic Fleet prior to the commencement of hostilities or at the beginning of the war aids in this mission. The string of Soviet and Warsaw Pact bases stretching from Leningrad to Rostock in East Germany provides a substantial in depth defense against any possible NATO conventional assault. In order to ensure control of the Baltic, the Warsaw Pact must also consider non-aligned Sweden. If Sweden did not remain neutral, Soviet ships and aircraft would be required to continually patrol the Swedish frontier. For the Warsaw Pact, the most difficult task in controlling the Baltic is to defend against an attack utilizing intercontinental ballistic missiles (ICBM's), intermediate range ballistic missiles (IRBM's), and Ground Launched Cruise Missiles (GLCM's). For example, the narrow Gulf of Finland is especially vulnerable to a nuclear attack. The "tidal" waves produced by a single nuclear explosion would destroy the Soviet Baltic fleet's extensive assets at Kotlin Island and Leningrad.

Air Superiority in the Baltic is a prerequisite for successful naval operations. The Warsaw Pact nations have

approximately 7,240 combat aircraft facing NATO, an advantage of almost three to one. Of course not all of these aircraft would be used in a confrontation in the Baltic, but the number provides some insight into the magnitude of the forces available to Soviet planners.[5]

The most important feature of the Warsaw Pact air picture is the continuing improvement in the operating range of tactical aircraft, accompanied by heavier ordnance leads, and improved avionics. The number of tactical aircraft available for offensive missions is increased even further by the increase in the numbers and capabilities of surface-to-surface missile (SAM) defenses.[6]

The MiG-23, the Su-17 (a variable geometry wing version of the Su-7), and the Su-19 with tactical radii in excess of 600 nm are now in squadron service in the Baltic. Even more impressive is the Backfire B which has entered squadron service in Murmansk and East Germany. The Backfire has a speed in excess of Mach 2.2 and an unrefueled subsonic combat radius of 2,650 nm. It is equipped with AS-4 Kitchen missiles which have a range of over 300 nm.[7]

Both the Tactical Air Army in East Germany and the 37th in Poland are now receiving the Backfire B aircraft, greatly extending the capability and range of air operations. In Poland, three new Soviet air bases, near Danzig, Gnesen, and Kolobrzeg, are further examples of additions to air capability. The map of Soviet Air Capabilities in the

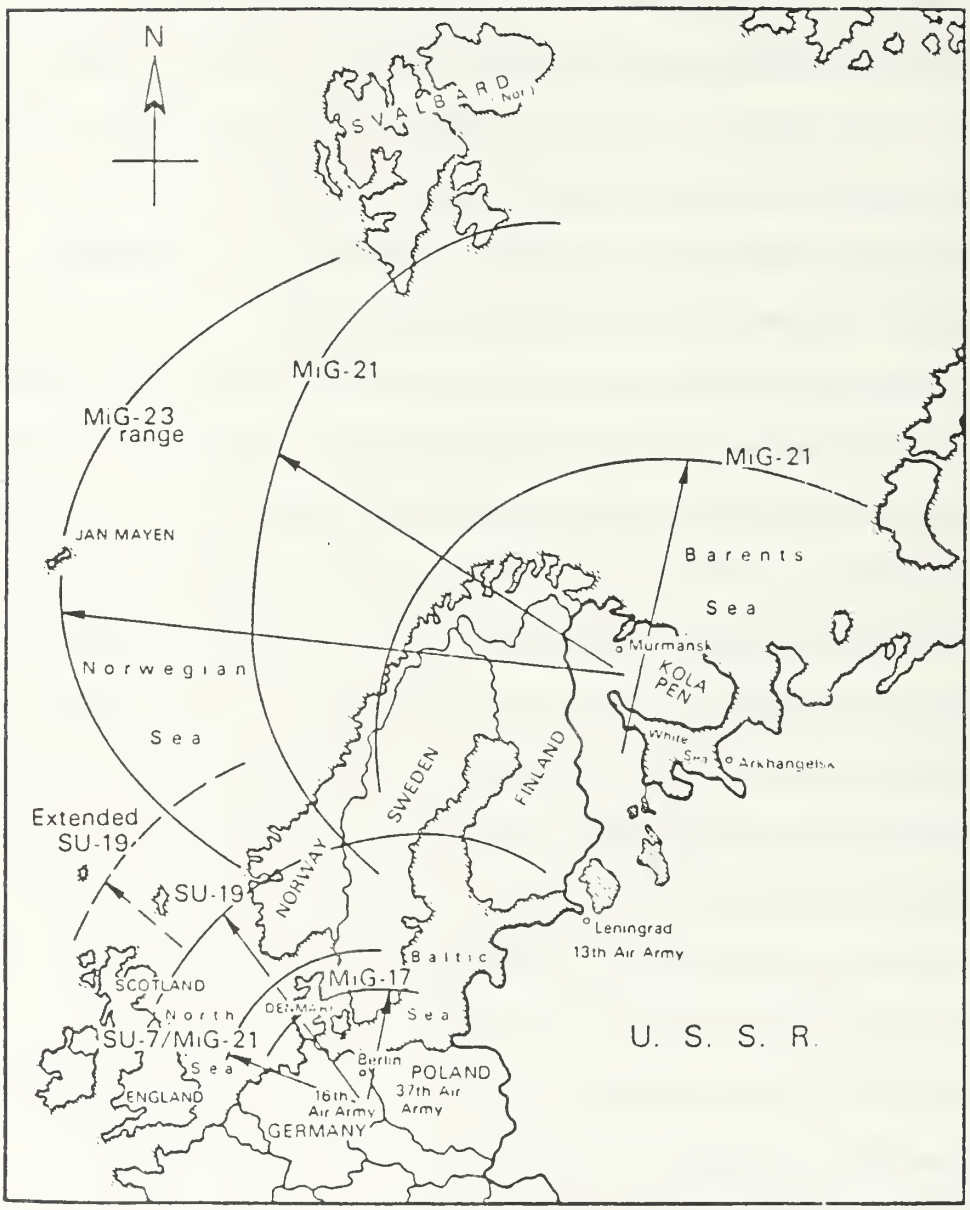
Northern TVD [Ref. Fig. 2] is impressive enough in its own right and takes into account current constraints on Soviet operations. It assumes fuel conserving missions, while not over-flying Sweden and operating only from home bases. The seizure of Danish and Nordic Peninsula bases, not to mention Swedish, would in effect nearly double the effective operational range of the MiG-23's and SU-19's.[8] Many dispersal airfields have already been identified in Warsaw Pact territory. Many of these airfields have blacktopped runways, protected fuel and ammunition storage, and modern electronic equipment but are deserted for most of the year.[9]

The Warsaw Pact has a numerical superiority of five to one in ships and submarines, and a three to one advantage in combat aircraft.[10] Even with these odds, the question of suitability of these forces to accomplish their missions is crucial. The physical composition of the Warsaw Pact combined Baltic Fleet and its NATO opposition of Danish and West German forces will be examined in the next two chapters in order to help answer the question of suitability.

During times of peace as well as war, the collection of intelligence must be carried out. The Soviet Union accomplishes this task through the use of radar facilities, overt and covert human intelligence sources, satellites, and air-sea reconnaissance. The Danish government has reported increased maritime surveillance by all three of the Warsaw Pact navies. Danish intelligence reported that special

FIGURE 2

SOVIET AIR CAPABILITY IN THE NORTHERN TVD



Source: "The Northern Theater: Soviet Capabilities and Concepts," Strategic Review by John Erickson, Summer 1976, p. 77.

intelligence collectors are deployed in the Kattegat and Skagerrak. There has also been as increase in the number of Warsaw Pact vessels conducting "navigational training" in Danish waters including circumnavigation of the Danish Zealand Island group and Bornholm Island. The Warsaw Pact has conducted and is now conducting small-scale exercises in the Kattegat and Skagerrak.[11] (Figure 3 shows patrols and flights used by the Soviet Union.) In 1981 the "Whiskey on the Rocks" episode in Sweden alerted the world to the Soviet Union's growing aggressiveness in the Baltic. Over the last several years the Soviet Baltic Fleet has shown the determination and the ability to penetrate into the heart of Sweden's defense perimeter.[12] Certain control of the Baltic is, however, dependent upon control of the Danish Straits.

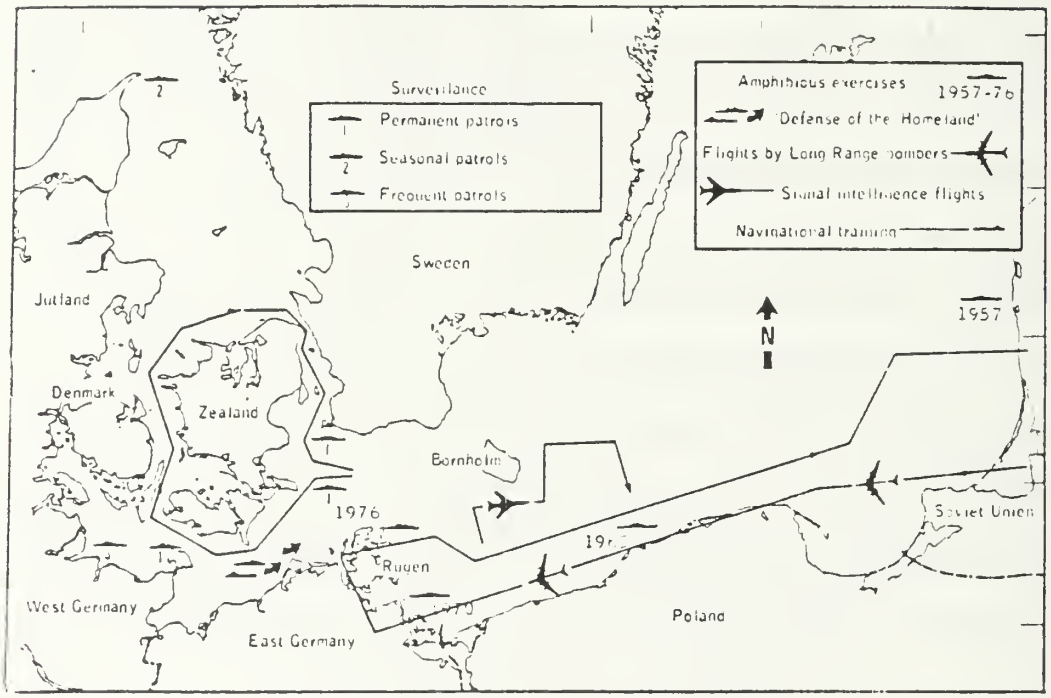
B. THE CONTROL OF THE DANISH STRAITS

The mission of controlling the Danish Straits is obviously interconnected with the previous mission and makes the accomplishment of the fourth mission possible, that of supporting the operations of the Northern Fleet. Many experts have stated that control of the Baltic is impossible without control of the Danish Straits.[13]

The mission of controlling the Danish Straits is the most difficult of the four missions for the Warsaw Pact combined Baltic Fleet. In order to accomplish this mission, it is necessary to completely neutralize all NATO air and naval

FIGURE 3

SOVIET UNION MILITARY ACTIVITY IN THE BALTIC SEA



Soviet Union military activity in the Baltic Sea has increased steadily as its capability in the naval and air support of amphibious assaults has improved in recent years. Danish intelligence officials have mapped the progress of Soviet military activities in the Baltic Sea, which have moved westward since 1957. In addition, Danish coasts are monitored continually by Soviet permanent and seasonal patrols.

Source: Eugene Kozicharow, "Soviet Buildup in Baltic Troubles Danes," Aviation Week and Space Technology, 13 November 1983, p. 49.

forces which can influence Soviet passage of the Straits. In addition, it is possible that NATO ground forces could restrict Soviet passage of the Straits, making a difficult mission even more difficult. The mission can be simplified by the use of proper timing and adequate deception by the Warsaw Pact prior to the commencement of hostilities. Soviet surface passage through the Danish Straits is at a high level in peacetime and could be increased under the guise of a routine exercise to provide a forward staging area. It would be extremely advantageous to the Baltic Fleet to penetrate into and past the Straits before the establishment of NATO mine barriers.

As can be seen, speed is very important in the Soviet seizure of the Danish Straits at the initiation of hostilities. Any delay which would allow NATO time to strengthen its defense would increase the amount of Warsaw Pact resources used to control the Danish Straits. To accomplish this mission may even necessitate the more time consuming option of invasion by Warsaw Pact ground forces into the Jutland Peninsula.[14]

In order to accomplish the task of controlling the Straits, the Soviet Union has at its disposal specially trained and equipped naval infantry units deployed in the area. These consist of the Soviet Baltic Sea Fleet's Naval Infantry Regiment, the Polish Seventh Landing Division, and the 29th Motorized Rifle Regiment of the East German Eight

Motorized Rifle Division.[15] The total amphibious strength available to the Soviet Union is approximately 10,000 personnel. Warsaw Pact amphibious capacity includes over one hundred vessels able to land 5,000 troops at one time. In addition, these nations possess a significant number of role-on, role-off merchant ships capable of follow-up operations once the beach heads are secured. Both the Soviet Union and Poland maintain airborne forces in the Baltic region.[16]

Should the Soviet Union successfully seize the Danish Straits, it would greatly facilitate the mission of controlling the Baltic and make the mission of supporting the operations of the Northern Fleet possible. After gaining control of the Danish Straits, the Soviet's first priority would be to increase the flexibility of action and the response time needed in case of conflict. To accomplish this, forward bases would have to be established in Denmark, West Germany, or Norway. Another priority of equal importance would be the third mission in the list, the support of ground force operations, primarily through resupply and securing the northern flank.[17]

"It can be said that a future battle for the Atlantic will be decided 50% in the Danish Straits," is a statement made by Captain Malcolm Cagle, USN, when he was the European representative at SHAPE.[18] If the four missions were to be ranked in order of priority, control of the Danish Straits

would be number one. Controlling the Danish Straits is a prerequisite to securing the northern flank of Warsaw Pact Forces in central Europe.

C. THE SUPPORT OF GROUND FORCE OPERATIONS

Admiral Gorshkov and all of the previous commanders-in-chiefs of the Soviet Navy have consistently and emphatically stated that this mission, support of ground force operations, is fundamental to the very existence of the Soviet Navy.[19] In the Baltic, all of the littoral nations could be the object of this mission. The Warsaw Pact combined Baltic Fleet is responsible for the maritime flank of any Warsaw Pact ground operation in the area. In Central Europe, the front which borders on the Baltic Sea would receive direct support from the Fleet. In addition to resupply, this support would include available air and naval gun fire support to advancing Warsaw Pact forces from various weapon systems organic to the Fleet. Electronic warfare support and intelligence collection by the Fleet would also significantly aid Warsaw Pact ground force operations. The substantial amphibious capability of the Warsaw Pact Baltic Fleet could directly improve the rate of advance in the ground battle.[20] Resupplying the ground forces through its sealift capability which would be augmented by "civilian" vessels would offer the Soviet Front commanders a partial solution to resupply problems, especially by reducing long,

vulnerable supply lines. The unique problems encountered by the shallowness of Northern German shores could be eased by the use of small craft and hovercraft support from the Warsaw Pact Baltic Fleet.[21]

The mission of supporting ground force operations is the historical, fundamental reason for the existence of the Soviet Navy, and for a time was its only declared reason for the existence of the Soviet Navy. As can be seen the Navy has moved far beyond this position. The ultimate goal of the Warsaw Pact Baltic Fleet is to pass through the Danish Straits and support Northern Fleet operations.

D. THE SUPPORT OF NORTHERN FLEET OPERATIONS

Giving support to the Soviet Northern Fleet is, potentially, the most significant mission of the Baltic Fleet in terms of defeating the forces of the NATO Alliance in the event of armed conflict. This is also the most difficult of the four primary missions to achieve since its success depends to a large extent upon the achievement of the previous three missions. Past naval exercises which have occurred on the high seas, particularly in the Northern and Norwegian Seas as well as closer to the Soviet Union, have repeatedly shown the existence of an operational link between the Northern and Baltic Sea Fleets.[22]

The superior maintenance, repair, and shipbuilding facilities available in East German, Polish, and Soviet ports

in the Baltic Sea are available to serve the Northern Fleet. (See Appendix C for a listing of Major Shipyards of the Soviet Union.) The climate in the Baltic ports is more conducive for major ship repair than the climate in the Kola Peninsula, home port for the Northern Fleet. The use of the White Sea Canal permits the inland transit of ships with draughts less than 10 meters between the two fleets; and larger ships routinely transit the Danish Straits.

Much of the Baltic Fleet is capable of conducting operations in the North Sea if the Baltic Fleet was supported by forward bases in occupied territories in West Germany or Denmark. Some of the major surface combatants and submarines could effectively complement and assist in Northern Fleet operations beyond the North Sea. The major problem with this is successfully transiting the Danish Straits and the western Baltic Sea if NATO defenses have not been totally eliminated.

Selected vessels would in all probability provide support to the Northern Fleet in any confrontation by prepositioning themselves in the North Sea prior to the commencement of hostilities by a peaceful transiting of the Straits under the guise of routine movements or exercises. The alternative to this peaceful transiting would be a forced passage against NATO opposition. Such a passage is potentially expensive and prohibitive to the Baltic Fleet.[23] The Warsaw Pact Baltic Fleet exercises amply demonstrate these four missions and the

importance placed on them. The next section discusses some of the major exercises of the last 16 years.

E. WARSAW PACT NAVAL COOPERATION

Soviet capabilities and intentions are demonstrated not only in the exceedingly large force levels but also in naval exercises. Joint exercises of the three Warsaw Pact navies in the Baltic have been held regularly since 1957. This cooperation has increased in both size and tempo over the last decade. The goal of joint exercises is to achieve uniform tactical and command and control procedures. The tactical units composed of ships from East Germany, Poland, and the Soviet Union have been commanded by officers of all three navies. However, Soviet naval officers have usually been in overall command. The emphasis in the joint exercises has been on the execution of amphibious landing operations and anti-submarine warfare. The amphibious maneuvers over the last decade have progressively moved from Soviet to Polish shored, and in the last few years, to East German waters shores.

In July 1968, the Soviet ships of the Baltic and Northern Fleets as well as ships from Poland and East Germany participated in a joint command and staff exercise, code named SEVER--Russian for north. The first major exercise of the Warsaw Pact navies covered the Baltic , Norwegian, and Barents Seas and the northern part of the Atlantic Ocean .[24]

This joint exercise was repeated on an even larger and more ambitious scale in the famous "OKEAN" exercises of April 1970 and 1975.

In "OKEAN 70," the role of the Baltic Fleet was to form the southern maritime flank of the Northern Fleet operational area. This exercise appears to confirm the fact that a mission of the Baltic Fleet is to support the Northern Fleet and that the Baltic Fleet operational area also includes the North Sea. "OKEAN 75" produced a number of Soviet naval firsts--largest number of naval units (over seventy) was deployed in the North Atlantic, with more than one hundred in the Baltic and the North Sea; Soviet submarines established a barrier between Ireland and the Norwegian coast; and amphibious landing exercise were conduced in the Bay of Lubeck. The NATO countries bordering the Baltic viewed the operations in the Bay of Lubeck as a significant first. As John Erickson observed, "...if turned through an arc of 180°, (this exercise) could be a formula for an assault landing operation aimed at Schleswig- Holstein."[25] In 1976, the Warsaw Pact nations of the Baltic completed another exercise demonstrating amphibious and anti-submarine warfare capabilities.

In 1980, the Warsaw Pact Baltic Fleet participated in a series of exercises beginning in April with an exercise off Rugen Island called, "Defense of the Homeland." In July, for the first time, joint exercises were conducted in the North

Sea. In September, the exercise, "Comradeship in Arms-80", was held in East Germany. In this exercise all three members of the Warsaw Pact Baltic Fleet participated in amphibious landing operations.

In 1981 two more Warsaw Pact exercises, "Soyuz" and "Zapad" again showed the readiness and capability of the Baltic Fleet. These operations, which were followed by a large number of portcalls, presented a clear and strong demonstration of Soviet strength and dominance in the region. The Warsaw Pact exercise Soyuz 81, which was supported by major combatants, was held in Poland between 17 March and 7 April. This exercise culminated in an amphibious landing exercise near the Polish city of Piaste. During this exercise the joint task force practiced anti-ship operations against a simulated "enemy" task force using concentrated missile and torpedo fire.

Zapad 81 was a joint ground-air-naval exercise conducted entirely within the Baltic Sea and eastern Baltic littoral involving approximately 100,000 ground troops and some 80 ships from all four of the Soviet Fleets. This exercise again included an amphibious exercise but with some impressive touches. The third wave came ashore on air-cushioned vehicles while a vertical envelopment was being carried out using Mi-8 helicopters to deliver the troops. This extremely large scale exercise included no forces from either East Germany or Poland. One may conclude that this

exercise, in addition to being training for the Soviet forces, was also a not too subtle reminder of Soviet power to Warsaw Pact nations, particularly Poland.[26]

In June 1982, the Warsaw Pact Baltic Fleet conducted an exercise in the North and Norwegian Seas. The emphasis of the exercise was on anti-submarine (ASW) warfare, anti-air warfare (AAW) and replenishment at sea. The exercise included two Soviet guided missile destroyers, an East German frigate, and two Polish submarines plus support vessels. After conducting ASW exercises in the North Sea, the task force moved near Trondheim, Norway, where AAW exercises were conducted against Badger strike bombers from the Soviet Northern Fleet.

In Soyuz-83 an amphibious exercise was carried out on the east German coast, west of Stolpmunde, on 7 June 83. According to reports, some 2,000 East German troops from amphibious ships and craft, landed on the beaches while Polish airborne assault troops were brought in by helicopters. In addition to the troops, one cruiser, eight destroyers and frigates, several submarines, twenty-three guided missile boats, small combatants subchasers, thirty amphibious warfare ships and craft, and twenty minesweepers as well as 30 combat aircraft from all three Warsaw Pact navies in the Baltic took part in the Soyuz-83 maneuvers.[27]

In the fall of 1983, the Soviet Union utilized ships in the Baltic and Pacific Fleets as well as ships in the

Mediterranean in a world-wide command and control exercise.[28] But the largest exercise ever conducted by the Soviet Union, Soyuz-84 began on the eighteenth of March 1984. It involved at least 200 surface ships and submarines of the North and Baltic Fleets. The ships were protected by land based aircraft including Backfire Bombers. The exercise began with the ships practicing an emergency sortee out of their home waters and through the Danish Straits which is the action the Soviet Union could be expected to take if general war with NATO seemed imminent. The rest of the exercise focused on anti-submarine warfare and the beating back of a simulated NATO force in the Norwegian Sea. At the conclusion of this exercise, the ships of the Baltic Fleet returned to the Baltic and conducted amphibious operations with other members of the Warsaw Pact combined Baltic Fleet at the Bay of Lubeck.[29]

While only the major exercises have been mentioned many other smaller exercises do take place. These normally involve two or three ship and last only a few days. As can be seen the Warsaw Pact Baltic Fleet trains together on a frequent basis with at least one major exercise per year. The Fleet is certainly preparing to act as a unit if the need arises. The exercises do support the argument that the mission of the Baltic Fleet is to (1) control the Baltic Sea, (2) control the Danish Straits, (3) support Soviet ground force operations, and (4) support the Northern Fleet. The

critical point to remember is that the missions and the Baltic Fleet do not stand alone, but instead reflect a part of the entire military establishment which is fully integrated under a single, unified strategy by the Soviet General Staff.

FOOTNOTES

[1]John Erickson, Soviet Warsaw Pact Force Levels (Washington D. C.: United States Strategic Institute [1976], pp. 16-18.

[2]Ibid., p. 19.

[3]Micheal Salitter and Ulrich Weisser, "Shallow Water Warfare in Northern Europe," U. S. Naval Institute Proceedings, March 1977, pp. 37-45.

[4]Albert Leo Romaneskii, "Nordic Balance in the 1970's," U. S. Naval Institute Proceedings, August 1973, p. 41.

[5]NATO and the Warsaw Pact Force Comparisons 1982 (Brussels: NATO Information Service, 1982), p. 17.

[6]Erickson, "The Northern Theater: Soviet Capabilities and Concepts," p. 78.

[7]William K. Sullivan, "Soviet Strategy and NATO's Northern Flank," Naval War College Review, July-August 1979, p. 29.

[8]Erickson, "The Northern Theater: Soviet Capabilities and Concepts," p. 78.

[9]"Soviets' Buildup in North Atlantic Exceeds Protection Level," Aviation Week and Space Technology, 15 June 81, p. 101.

[10]Ibid., p. 104.

[11]Eugene Kozicharow, "Soviet Buildup in Baltic Troubles Danes," Aviation Week and Space Technology, 13 November 78, p. 50.

[12]"The Soviets N-Sub," World Press Review, January 1982, p. 19.

[13]Salitter and Weisser, "Shallow Water Warfare in Northern Europe," p. 44.

[14]Alexander K. Maconochie, "Across or Along Soviet amphibious Options," U. S. Naval Institute Proceedings, April 1980, p. 50.

[15]Robert D. Wyman, "Their Baltic Sea Fleet," U. S. Naval Institute Proceedings, October 1982, p. 159.

[16]Kozicharow, "Soviet Buildup in Baltic Troubles Danes," pp. 30-31.

[17]Wyman, "Their Baltic Sea Fleet," p. 159.

[18]Malcolm Cagle, "The Strategic Danish Straits," U. S. Naval Institute Proceedings, October 1960, p. 36.

[19]S. G. Gorshkov, "The Development of the Art of Naval Warfare," trans. Theodore A. Neely, J., U. S. Naval Institute Proceedings, June 1975, p. 9.

[20]Mathew J. Whelan, "The Soviet Baltic Fleet: An Amphibious Force in Being," U. S. Naval Institute Proceedings, December 1981, p. 125.

[21]Maconochie, "Across or Along: Soviet Amphibious Options," p. 47.

[22]Kennedy, "Zapad 81: Successor to Okean?" pp. 29-32.

[23]John Hackett, The Third World War (New York: Macmillan Publishing Company, Inc., 1979), pp. 188-190.

[24]Charles Lavelle Parnell, "'SEVER' and the Baltic Bottleneck, p. 28.

[25]John Erickson, "The Northern Theater: Soviet Capabilities and Concepts," Strategic Review, Summer 1976, p. 74.

[26]Floyd D. Kennedy, "Zapad 81: Successor to Okean?" Sea Power, January 1982, pp. 30-31.

[27]Milan Vego, "East European Navies, "U. S. Naval Institute Proceedings, March 1984, p. 46.

[28]Gerald F. Seib, "Soviet Maneuvers Puzzle U. S. Analysts," Wall Street Journal, 9 April 84, p. 38.

[29]Bob Adams, "Soviet Naval Exercises Reveal Weakness - Size of Operation Surprises Analysts," St. Louis Post-Dispatch, 15 April 84, sec. b, p. 1.

IV. CONSTRAINTS ON BALTIC MARITIME OPERATIONS

The Baltic Sea can be characterized as a peripheral sea. It connects with the ocean and is accessible to ocean shipping. But at the same time, it forms an inland sea with narrow entrances limited in number and easily controlled. Any analysis of maritime operations must first take into account the physical features of the Baltic Sea consisting of the political geography, natural geography, oceanographic factors, and climatological factors.

A. THE INFLUENCE OF POLITICAL GEOGRAPHY

In order to understand the constraint upon naval operations in the Baltic, a brief synopsis of the littoral, political boundaries along the coastline is necessary. While political jurisdiction over the land mass on the Swedish side has remained essentially unchanged for the last three centuries, the opposite parts of the coastline have undergone many changes during the same length of time.

Prior to World War I, only Germany and Russia bordered on the southern and eastern coast of the Baltic. German territory reached from Schleswig-Holstein (10° East) to Memel (Klaipeda) which is situated at 21° East and 56° North. The Russian part of the coastline began at Memel and stretches to the northern most part of the Gulf of Bothnia. When Finland,

Estonia, Lithuania, and Latvia obtained their freedom from Russian rule after the First World War, the Soviet Union was pushed back to the innermost tip of the Gulf of Finland almost to the port of Leningrad. Germany's portion of the coastline remained intact except for a stretch of coastline between East Prussia and west to the German border (the Polish Corridor). And at the same time, the German port city of Danzig (Gdansk) became an independent free city.

Germany's defeat in World War II caused a fundamental change in the jurisdiction over the Baltic coast. Latvia, Estonia, and Lithuania were absorbed by the Soviet Union during the war as a matter of self protection. The Germans were driven from East Prussia, the Polish Corridor which they had reoccupied during World War II, and the city of Danzig. At the end of World War II, the entire coastal area east of the Oder River was occupied by the Soviet Union. The northern half of East Prussia, including the ports of Memel (Klaipeda), Konigsberg (Kaliningrad), and Pillau (Baltiysk), was taken by the Soviet Union. The Russians transformed Memel into a large oil terminal capable of handling modern supertankers. Konigsberg, which is now the headquarters of the Soviet Baltic Fleet, and Pillau were fortified and made into important naval bases. The coastal area between the new Russian border and the Oder River was given to Poland. Also ceded to Poland were Stettin (Szczecin), an important city on the left bank of the Oder, and Swinemunde (Swinoujscie) at

the mouth of the Oder River. In addition, at the end of World War II, all of the coast of East Germany must be counted as under the control of the Soviet Union. Communist dominion now stretched from the Finnish border west to Lubeck and to Travemunde, the port which serves Lubeck. Only the coasts of Schleswig-Holstein and Denmark were in the possession of the Western Alliance and this is how it remains today.[1]

B. THE INFLUENCE OF NATURAL GEOGRAPHY

The greatest geographic factors influencing the employment of naval forces and aviation in a "narrow" sea are 1) latitude, 2) shape, 3) extent and size, 4) coastline's length, mutual position, configuration and character.[2]

The geographic position of a sea determines its dominant climate and the length of its nights. The Baltic Sea lies between latitude 54° North and 66° North. In January the duration of the nights ranges from approximately 14 and 1/2 hours in the South to approximately 18 hours in the North. These long hours of darkness when considered with the short distance between opposing shores provides extremely favorable conditions in which to conduct naval operations, especially if the opponent is superior in air power. The opposite is obviously true in the summer months. At 66° North during the month of June, the sun never sets.[3]

In geographic terms, the Baltic is approximately trefoliate in shape, the three leaves being the Gulf of Bothnia to the north between Sweden and Finland, the Gulf of Finland to the east on the Russian coast, and the Gulf Riga in the Estonian SSR.[4] The Baltic Sea extends along its north-south axis for roughly 920 nautical miles (nm) with an average width of slightly more than 105 nm. It has a total area of 147,500 square miles. The sea distances are relatively short. For example the distance between the Soviet base at Liepaja and the Swedish island of Gotland is only 90 nm. The Danish held Island of Bornholm is only 50 nm from the Polish coast.

The small distances from one point to another point of land in the Baltic allow the side possessing air superiority to dominate a battle to a far greater extent than in an open ocean. The air threat alone places severe limits on the use of large surface combatants such as cruisers and destroyers unless these ships are protected by strong and reliable air cover. At the same time the proximity of one point to another would allow the weaker side to carry out surprise air and sea strikes with a high probability of success and permit the execution of repeated offensive operations in rapid succession making it very difficult for the defender to recover from the damage suffered in the previous strikes. The small distances would also allow for rapid change in the deployment of ships and aircraft. Therefore, both naval and

air forces could be rapidly concentrated or dispersed as the need arose.

The shape and topographic relief of a coast have a large and direct influence upon: (1) size, complexity and amount of vulnerability of bases for naval operations; (2) coastal surveillance and defense system; (3) degree of threat of an attack from across the sea.[5]

The shores of Sweden, Finland, and also part of Denmark have extremely indented coasts backed by relatively high and steep terrain. These coasts offer much better condition for the construction of naval bases and underground shelter than do the southern and eastern shores of the Baltic.

From Kronstadt Naval Base on Kotlin Island to the Danish island of Bornholm which marks the beginning of the Danish Straits is approximately 700 nm.[6] Except for the White Sea Canal connecting Leningrad and the North Sea, the Danish Straits are the only entrance to the Baltic Sea.

The White Sea canal has the strategic value of allowing the movement of naval vessels between the Baltic and Northern Fleets without having to transit the Danish Straits. But this is limited, due to the 10 meter depth of the canal, the length of the locks, and by the fact that it is frozen for part of the winter. In war, canals are extremely vulnerable to interdiction as was demonstrated by the Luftwaffe in June 1941 when they closed the Baltic-White Sea Canal by destroying its locks.[7]

The Danish Straits are made up of three major areas: the island passages, the Skagerrak, the Kattegat which is so narrow it was named the "Catgut" by early Vikings.[8] The island passages are made up of three major, international, natural passages: (1) the Sound (Orerund) between the island of Zealand on which Copenhagen lies and the western coast of Sweden, is at one point only three miles wide; (2) the Great (Store) Belt which reaches a width of eleven mile; and (3) the Little Belt. In addition to being narrow, the Danish straits are also shallow, making it extremely improbable that any ship or submarine could transit the straits without detection by modern devices.[9] [Ref. Fig. 4.]

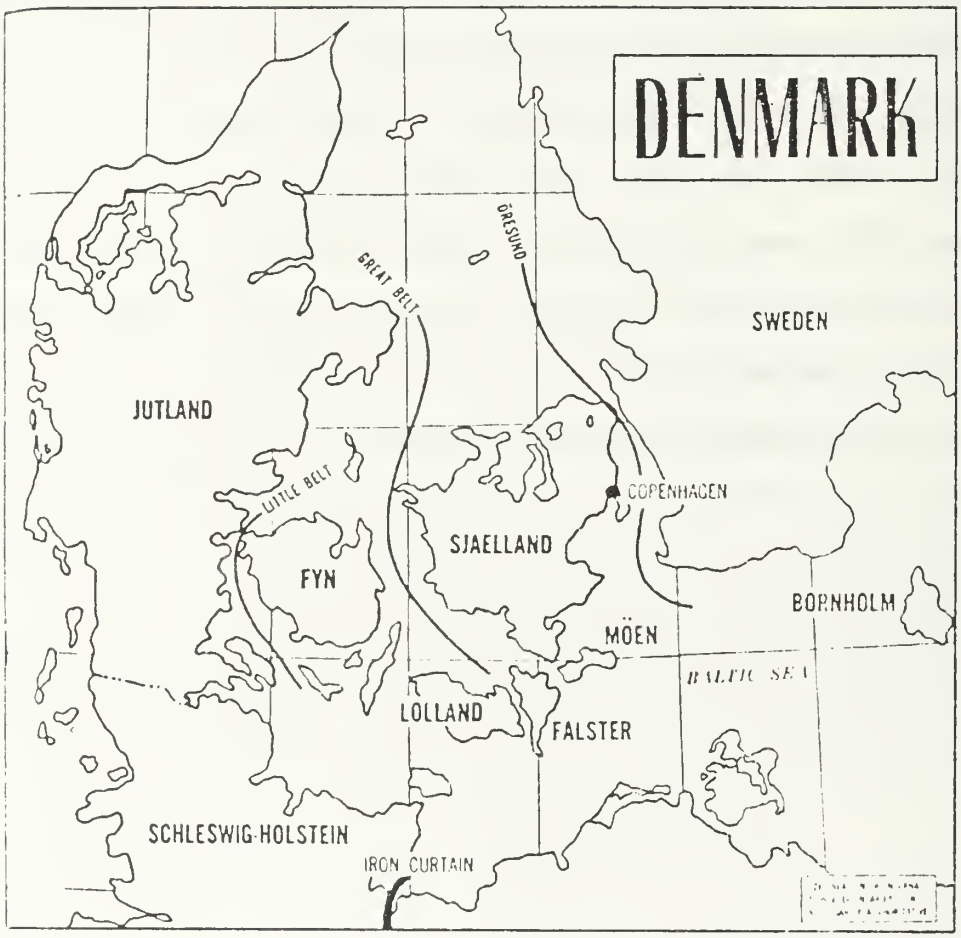
C. THE INFLUENCE OF OCEANOGRAPHIC FACTORS

The most important oceanographic factors which affect the tactical employment of surface ships, submarines, and their weapons and sensors in the Baltic are (1) the water's depth, (2) the character of the seabed, (3) the tides, and (4) water transparency.[10]

Over 60 percent of the total area of the Baltic Sea has depth of less than 50 meters. In most of the remainder the depth is less than 200 meters but does reach 460 meters between the island of Gotland and the Swedish Coast. In the Danish Straits, the average depths in the Great Belt are 13 - 23 meters and in the Sound 16 - 38 meters. The depth offshore in the western Baltic Sea are between 18 and 45

FIGURE 4

MAP OF THE DANISH STRAITS



Source: Henrik B. Konradsen, "Denmark - Key to the Baltic Gate," Military Review, June 1966, p. 43.

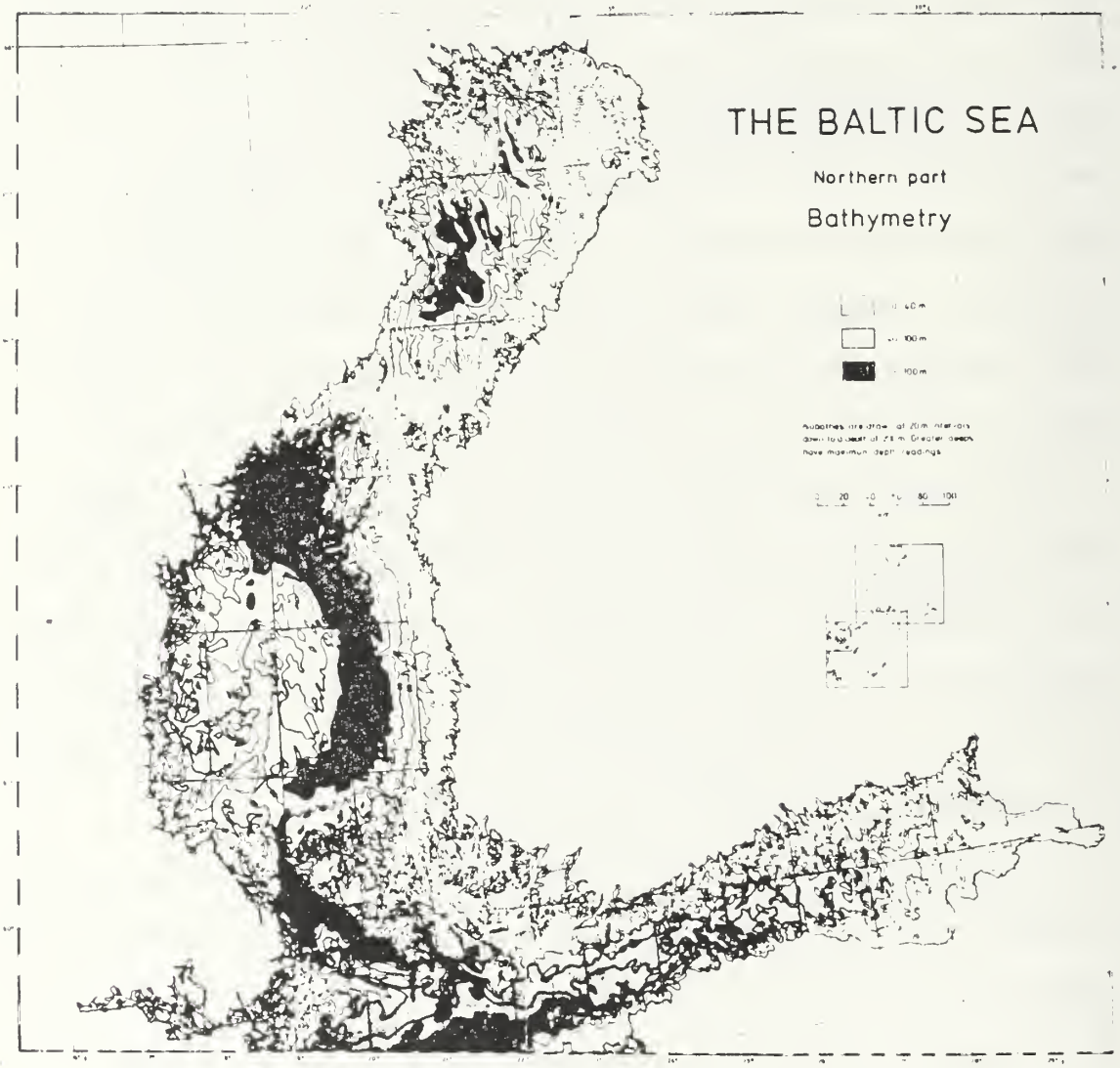
meters, and 54 to 180 meters in the central region. The greatest average depth are off the coast of Sweden, where they range from 60 to 150 meters in most areas. In the Gulf of Bothnia the water varies from as low as 23 meters in the north to 130 meters in the south. The water depth in the Gulf of Finland ranges from 36 to 90 meters. In contrast to the Swedish coast, the average depth of the water off of the Soviet and Polish coasts is only 18 to 36 meters. The only exceptions are the Gulf of Riga and the Gdansk Gulf where the water reaches 108 meters. The depth does vary significantly depending on the region. (Ref. Fig. 5 and Fig. 6)[11]

The water depth in the Baltic is the most significant oceanographic factor and directly influences the conduct of naval operations. It determines (1) the size of ships and submarines to be utilized, (2) the ship's speed of advance, (3) the use of underwater weapons, and (4) the effectiveness of underwater anti-submarines sensors.[12]

Extremely shallow waters may restrict or exclude the use of major surface combatants and submarines. The depth of the water plays a critical role in the employment of submarines in the Baltic. Large conventional submarines require 21 to 25 meters for diving; medium submarines 13 to 20 meters; small submarines 10 to 15 meters; and midgets 5 to 10 meters. A medium size submarine has a hull height of about 15 meters and requires another ten meters of water for safety. Depending upon the transparency of the water an additional

FIGURE 5

BATHYMETRIC MAP OF THE NORTHERN BALTIC SEA



Source: Aarno Voipio, ed., The Baltic Sea (New York: Elsevier Scientific Publishing, 1981) enclosure.

FIGURE 6

BATHYMETRIC MAP OF THE SOUTHERN BALTIC SEA

Source: Aarno Voipio, ed., The Baltic Sea (New York: Elsevier Scientific Publishing, 1981) enclosure.

ten or more meters may be needed by a submarine when operating submerged in order to escape detection from the air. A submarine may require 35 to 40 meters just for safe underwater operations to say nothing of evasive action.[12]

Shallow waters also influence the speed of large vessels due to the refraction of pressure waves off of the seabed hindering the ship's progress. The shallowness of the Baltic also restricts the use of some torpedoes, especially along the Polish and Soviet shores where the running depth exceeds the depth of the water; but mines which can be used to a depth of 400 meters may be effectively utilized throughout the Baltic.

The major limitations on the performances of sonar equipment in the Baltic are due to the great variation in and unpredictability of the sea's (1) temperature, (2) surface conditions, (3) salinity, (4) tides, (5) currents, (6) bottom reflection and absorption, and (7) background noise.[13]

The surface temperatures varies greatly in the Baltic but generally increases from north to south. In the central basin the average winter surface temperature is 2°C while in summer it is 15°C. The unpredictability of the surface temperature creates many random thermoclines which greatly complicate the detection of submarines.

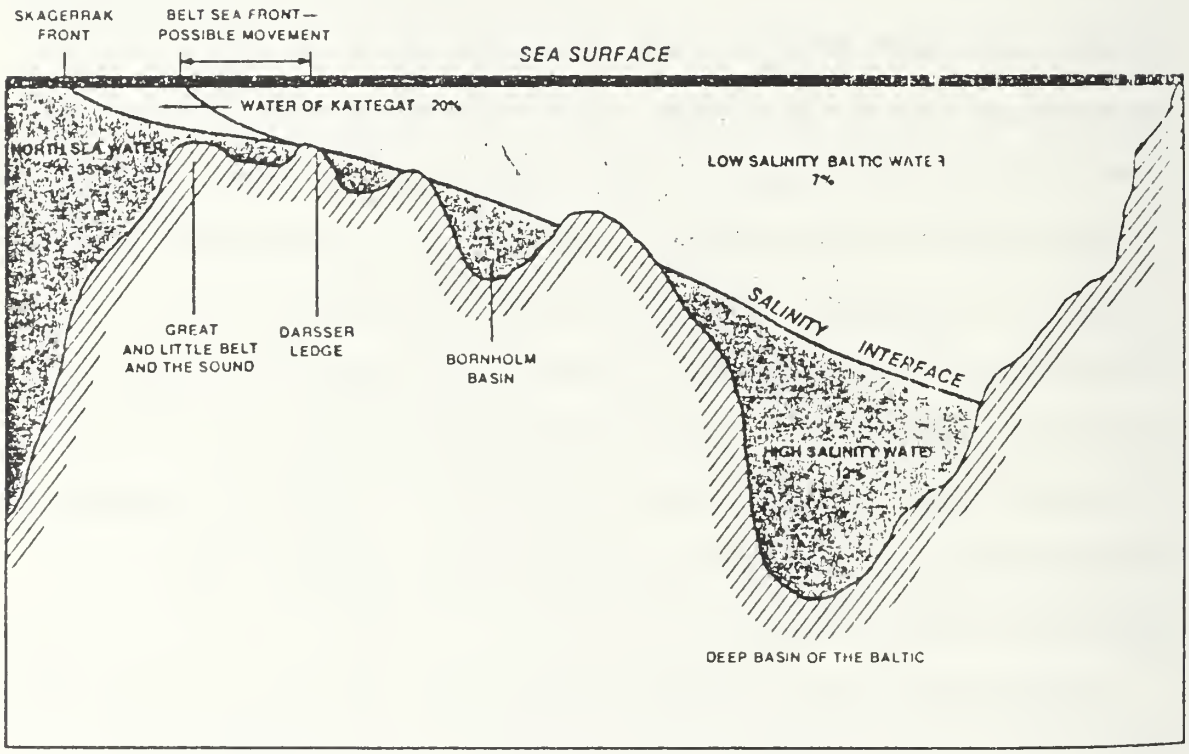
While there is a large difference in the tides in the North Sea, the tide is almost non-existent by the time it is east of the Straits. This does not mean that the waters of

the Baltic are still. Easterly winds have increased water levels in the western Baltic up to ten feet while westerly winds lower the level considerably. Hundreds of rivers flow into the Baltic creating an excess of fresh water. The water in the northern end of the Gulf of Bothnia is so low in salt content as to be drinkable. This is reminiscent of the fact that 35,000 years ago the Baltic Sea was, in fact, a fresh water lake.[14] When easterly winds blow this water toward the Straits, it lowers salinity but tends to raise the temperature. The opposite happens when westerlies are blowing. Therefore, salinity and temperature can vary in extremely complex and unpredictable ways creating random thermoclines, a nightmare for sonar operations.[15] [Ref. Fig. 7, 8, and 9]

The Baltic Sea is never quiescent. Slight seas of up to 0.9 meters are common in all seasons. Rough seas of up to 1.5 meters are prevalent in the fall. Throughout the year, low swells, 10.3 to 1.8 meters are frequent at the Straits while moderate swells of 1.8 to 4 meters occur in the central basin. High swells of greater than four meters are infrequent and only near the Danish Straits.[16] The greatest difference between sound propagation in the open ocean and in the Baltic is the degree of refraction from the shallow seabed. In the Baltic the bottom is composed largely of sand or mud. Sound is lost least over a smooth sandy bottom and the greatest over soft mud. Therefore, a knowledge of the

FIGURE 7

BALANCE OF WATER AND SALINITY SEPARATION IN THE BALTIC



Source: Micheal Salitter and Ulrich Weisser, "Shallow Water Warfare in Northern Europe," U.S. Naval Institute Proceedings, March 1977, p. 38

FIGURE 8

CHART OF THE SALINITY LEVELS, DENSITY PROFILES, AND TEMPERATURES IN THE BALTIC

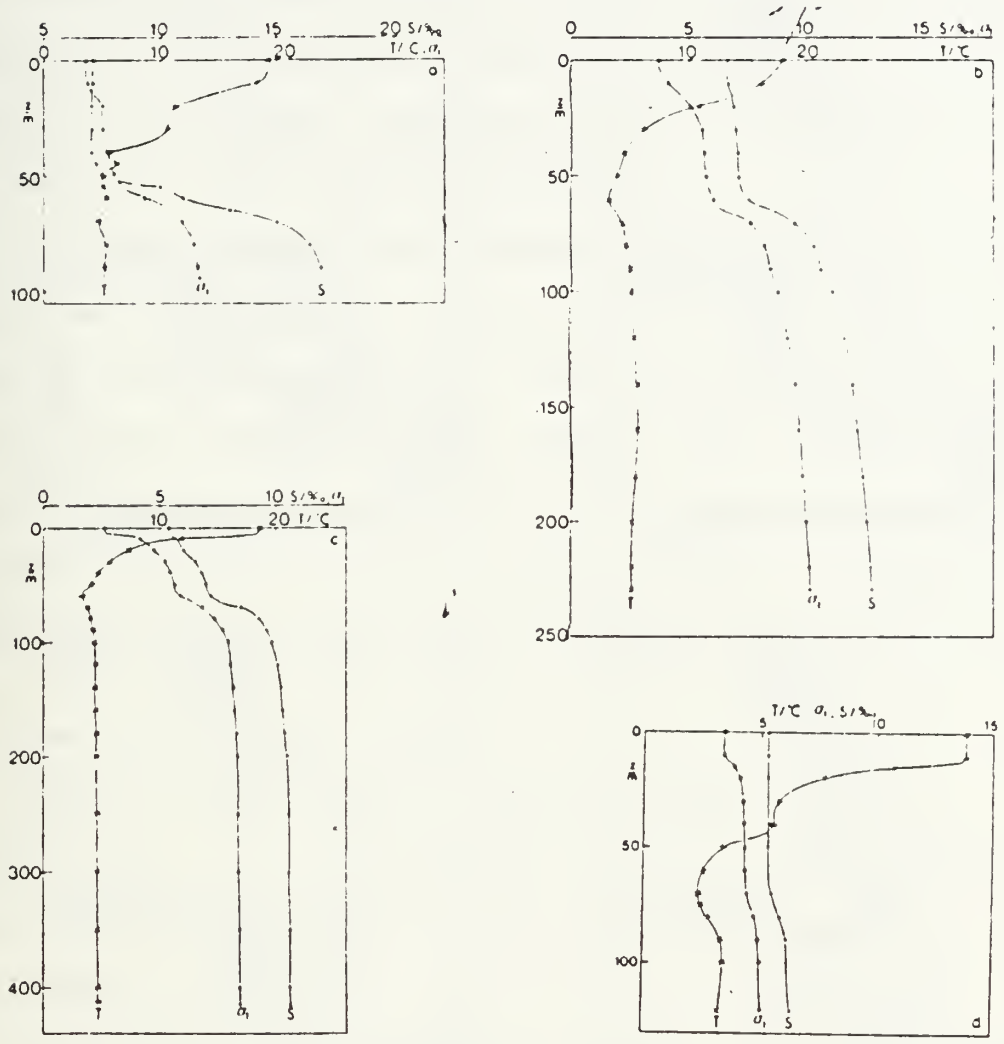


Fig. 3.2. Salinity ($S/^{0}\!/_{00}$), temperature ($T/^{\circ}C$) and density (σ_t) profiles from: (a) Bornholm Deep 55°19.5'N, 15°38.5'E, 4.8.1938; (b) Gotland Deep 57°21.5'N, 20°02.5'E, 27.7.1938; (c) Landsort Deep 58°38.5'N, 18°16.5'E, 28.7.1938; (d) Bothnian Sea 61°04'N, 19°35'E, 12.7.1938.

Source: Aarno, Voipio, ed., The Baltic Sea (New York: Elsevier Scientific Publishing, 1981)

FIGURE 9

SURFACE SALINITY AND TEMPERATURES

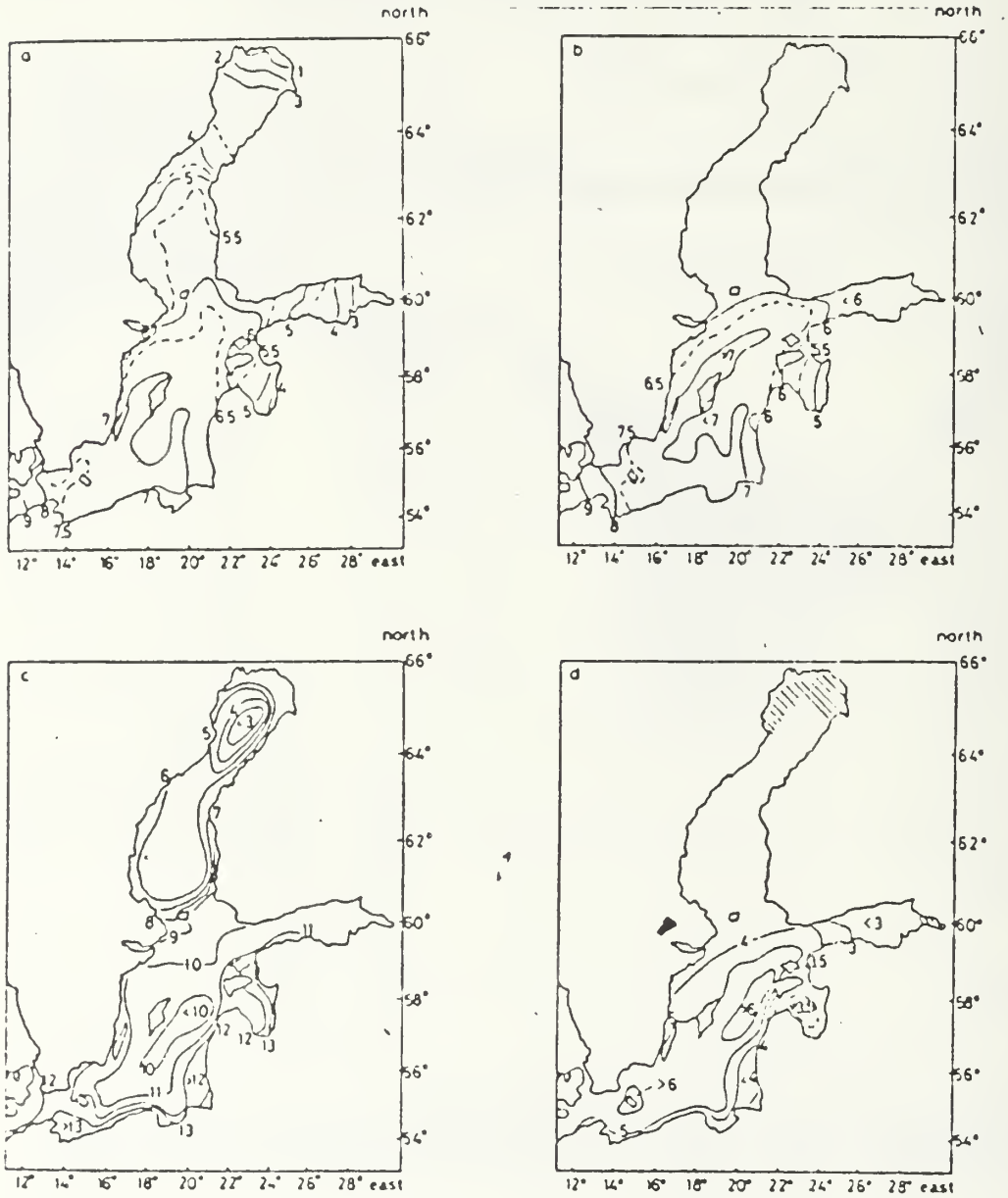


Fig. 3.1. Surface salinity ($S/^{\circ}\infty$) distribution for June (a) and December (b). From Bock, 1971.

Surface temperature ($T/^{\circ}C$) distributions for June (c) and December (d). From Lenz, 1971.

Source: Aarno Voipio, ed., The Baltic Sea (New York: Elsevier Scientific Publishing, 1981).

sea bottom compositions is essential to the operator of sonar equipment.

Background noise in the Baltic is primarily man-made and consists of ship noise and coastal settlement activities. A shallow bottom and an indented coastline make classification of refracted noises almost impossible.

The water's depth, the character of the sea, the tides, and water transparency in the Baltic Sea influence the conduct of naval operations. These oceanographic factors determine the types of ships, weapons, and aircraft that can be used effectively in the Baltic Sea. Another important factor, discussed in the next section, which influences naval operations in the Baltic Sea is climate.

D. THE INFLUENCE OF CLIMATE

Climatological factors, such as winds, waves, precipitation, ice, cloudiness, and air temperature, limit the type and employment of ships, aircraft, and their sensors and weapons.

From October through March, westerly seas predominate in the Baltic. Frequent, severe storm add to the roughness of the sea. This is somewhat reduced in the mid-winter due to the extensive ice cover. The high sea states reduce the speed of surface ships, affect comfort, and increases crew fatigue. In an average year, the employment of frigate-size and smaller craft is seriously hampered for 60 days because

of strong winds and high seas rather than ice. Sonar performance is also greatly affected by high or rough seas. The reverberation from the sea surface increases in intensity with an increase in the sea state. High winds create a large number of air bubbles in the water which absorb and scatter sound waves.

Clouds, rain, snow, and fog can significantly reduce visibility over the sea surface and hinder the effectiveness of ships. In the Baltic, cloudiness is the greatest from October through February. In the southern part of the Baltic, moderate cloudiness prevails throughout the year. In winter and spring months, cloudiness usually decreases from land to open sea while the opposite is true during the late fall and early winter. Precipitation in the Baltic is greatest in the summer and early fall and the least in the late winter and early spring. Snow occurs most frequently over the northern Baltic, where it falls an average of 40 to 50 days per year.

In the Baltic ice normally presents significant difficulty to the operation of ships, even in ordinary winters. In severe winters, the entire Gulf of Bothnia north of the island of Gotland is frozen over. In the Gulf of Riga, ice hinders navigation for 60 to 120 days and stops it for 30 to 80 days per year. Even traffic in the Gulf of Finland may be interrupted for several months despite

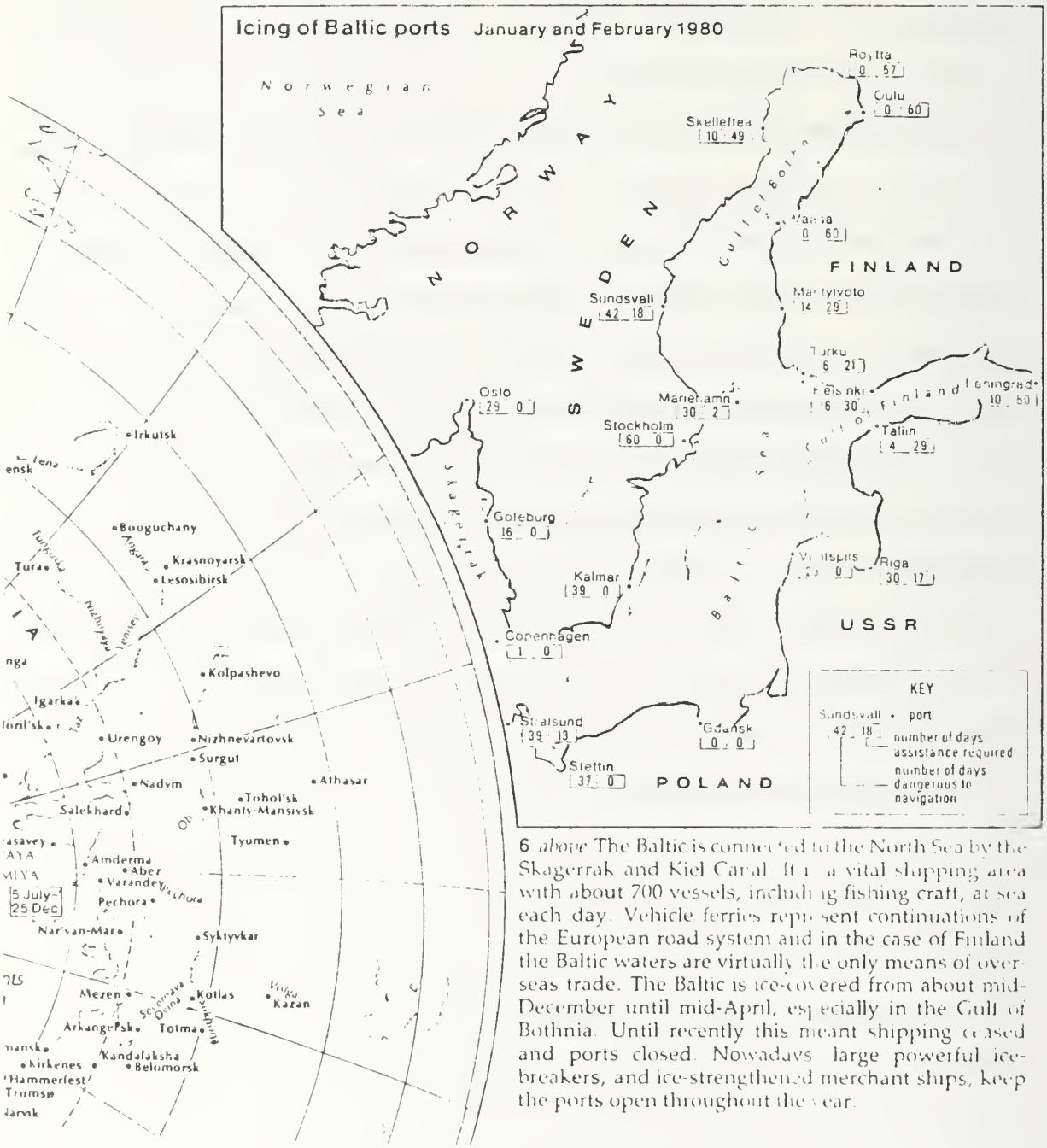
the best efforts of the fleet of Soviet icebreakers.[17] (See Figure 10 for a Chart of Icing of Baltic Ports in 1980.)

In waters covered with ice, the intensity and character of background noise is extremely variable due to changes in (1) wind, (2) snow cover, (3) air temperature, and (4) continuity of the ice. Continuous shore-fast ice under rising conditions is very quiet. However a sea with a broken ice pack may have a noise level 5 - 10 decibels higher than the noise level in the same sea state without ice. Wind and the associated drifting of snow causes a high level of ambient noise. Wind noise is also greater over a non-continuous ice cover. Still another source of noise in a non-continuous ice cover is the bumping and scraping together of ice floes. Sonar performance is greatly affected by these factors making the difficult problems of clarifying contacts in the Baltic even harder to resolve.[18]

In sum, the Baltic is an exceedingly complex, difficult, and, in some cases, unpredictable area within which to conduct naval operations. The geographic, oceanographic, and climatological factor presented appears to favor the use of a force of smaller combatants, mine warfare, and amphibious operations.

FIGURE 10

CHART OF ICING OF BALTIC PORTS IN 1980



6 *above* The Baltic is connected to the North Sea by the Skagerrak and Kiel Canal. It is a vital shipping area with about 700 vessels, including fishing craft, at sea each day. Vehicle ferries represent continuations of the European road system and in the case of Finland the Baltic waters are virtually the only means of overseas trade. The Baltic is ice-covered from about mid-December until mid-April, especially in the Gulf of Bothnia. Until recently this meant shipping ceased and ports closed. Nowadays large powerful ice-breakers, and ice-strengthened merchant ships, keep the ports open throughout the year.

Source: Alistair Couper, ed., The Times Atlas of the Oceans (New York: Van Norstrand Reinhold Co., 1983) p. 149.

E. THE CHARACTER AND TYPE OF NAVAL OPERATIONS

The small size of the Baltic tends to restrict, or even preclude, the employment of surface combatants larger than 1,500-2,000 tons in displacement. However, the use of major surface combatants, such as large destroyers or cruisers, cannot be entirely excluded. They will be capable of operating in the Baltic, providing friendly forces possess a full command of the air and sub-surface for the time they remain in the area. Nonetheless, even if the latter requirements are fulfilled, the problems of employing major surface combatants in the Baltic is greatly compounded due to the presence of not only enemy aviation, but also submarines, missile equipped fast attack craft, and numerous mines.

The small size and predominately shallow waters of the Baltic favor the employment of conventionally powered submarines up to 500 tons in size. The Baltic provides an excellent place for the use of fast attack craft, weather permitting. The shallowness of the waters offers ideal possibilities for the extensive employment of mines. The small distances and a large number of low, flat, sandy beaches on the southwestern and eastern shores of the Baltic, combined with easy access routes to the country's interior, offer great opportunities for the conduct of small-size, and even large-scale amphibious landings. Also, the abundance of islands and islets off of the coasts of Sweden and Finland and to a lesser extent Denmark offer excellent opportunities

for surprise attacks by fast attack craft, and surprise raids and sabotage actions by frogman/commando teams.

In contrast to war on the open ocean, a conflict on a narrow sea such as the Baltic would force both sides to face each other more directly due to the small distances involved. Thereby, greater opportunities would exist to carry out surprise, short, intense missions against enemy forces, than on the open ocean. At the same time, the side with the weaker navy would in the Baltic have great difficulty in avoiding contact with enemy forces. In contrast, due to the short distances in the Baltic inferiority on the sea would not necessarily prevent the conducting of short-term strike missions in selected areas.

Combat missions in the Baltic, especially those where offensive aircraft and fast attack craft are involved and both sides were roughly equal in strength would be conducted with great rapidity and intensity. A correspondingly high rate of attrition of both men and material should be expected.

A war in the Baltic would consist of numerous, short, diverse,surprise tactical-size missions carried out by (1) surface combatants, (2) submarines, and (3) aviation. Offensive missions would include (1) strikes against enemy surface warships and amphibious forces on the open sea, (2) area searches by ASW forces (An extremely difficult mission as was pointed out due to the complexities of the

Baltic.) (3) air search and strikes against enemy surface ships and submarines at their bases, (4) mining of enemy waters and probable routes of surface ships, submarines, and convoys, (5) strikes by surface combatants, submarines and aviation against enemy merchant shipping, (6) support of amphibious operations, (7) bombardment of coastal targets in support of ground forces, and (8) raids by frogman/commando teams.

Defensive naval missions in the Baltic would include (1) protection of the army's maritime flank, (2) defensive mining of waters, (3) protection of Sea Lines of Communication (SLOCs), ASW "point defense" of own warships, amphibious forces and convoys against enemy submarines, (5) protection of submarines during their departure to and arrival from a combat patrol, (6) protection of bases and anchorages, and (7) transport of troops and material. The following two chapters will examine in detail the force composition of both the Warsaw Pact and NATO forces in the Baltic.

FOOTNOTES

[1]William L. Langer, ed. An Encyclopedia of World History, 5th ed. (Boston: Houghton Mifflin Company, 1972), pp. 1156 - 1158.

[2]Milan Vego, "The Baltic-Naval Operations," Navy International, February 1983, p. 70.

[3]Ibid.

[4]Laurence Griswold, "The Cork in the Baltic Bottle," Sea Power, January 1972, pp. 11-12.

[5]Vego, "The Baltic-Naval Operations," p. 71.

[6]Laurence Griswold, "The Chokepoint War," Sea Power, July 1973, p. 15.

[7]David Fairhill, Russian Sea Power (Boston: Gambit Inc., 1971), p. 62.

[8]Griswold, "The Chokepoint War," p. 15.

[9]Malcom W. Cagle, "The Strategic Danish Straits," U.S. Naval Institute Proceedings, October 1960, pp. 36-37.

[10]Vego, "The Baltic-Naval Operations," p. 72.

[11]Aarno Voipio, ed., The Baltic Sea (New York: Elsevier Scientific Publishing, 1981), pp. 72 - 73.

[12]Vego, "The Baltic-Naval Operations," p. 72.

[13]Randall Gray, ed., Conway's All the World's Fighting Ships 1947-1982 Part II: The Warsaw Pact and Non-Aligned Nations (Annapolis: Naval Institute Press, 1983), pp. 492-496.

[14]John M. Collins, American and Soviet Military trends Since the Cuban Missile Crisis (Washington D. C.: Georgetown University Press, 1978), p. 73.

[15]Aarno Voipio, ed., The Baltic Sea (New York: Elsevier Scientific Publishing, 1981), p. 135.

[16]Edward Wegener, "A Strategic Analysis of the Baltic Sea," Naval Review 1969, May 1969, p. 10.

[17]Vego, "The Baltic-Naval Operations," p. 74.

[18]Ulrich Weisser and Klaus Jancke, "The Problems in the Baltic," NATO's Fifteen Nations, April-May 1978, p. 5.

[19]Vego, "The Baltic-Naval Operations," p. 75.

V. THE WARSAW PACT COMBINED BALTIC FLEET

The conventional, war-fighting strategy of the Warsaw Pact, in part, calls for rapidly seizing major portions of Western Europe in order to keep the battlefield well west of the Soviet homeland. Warsaw Pact Baltic naval strategy calls for the rapid seizure of the Danish Straits, securing the maritime flank of the Soviet ground forces, and dominating the Baltic Sea.[1]

The Soviet Navy is the only one of the Warsaw Pact fleets on the Baltic which has a global presence or an open-ocean operating capability. The navies of Poland or East Germany are not built with the endurance necessary for open-ocean operations nor do they have an under way replenishment capability; though in the case of East Germany, this is beginning to change. In 1981 East Germany built two ships capable of replenishment at sea. East Germany and Poland hold most of the Warsaw Pact's Baltic coastline but their two navies combined make up less than half of the naval forces available to the Warsaw Pact for operations in the Baltic. The East German and Polish navies do, however, provide specialized capabilities to the Soviet Union which are particularly useful in the Baltic region. For example, the East Germans have a mobile-rifle division

especially trained in amphibious operations and the Poles have a marine division.

Even though East German and Polish officers receive training in Soviet naval schools and cooperate in joint exercises, cruises, and various other exchanges, they have relatively little day to day contact with each other. East German and Polish naval units normally operate independently unlike the manner in which East European armies and air forces are intermixed with Soviet formations. This has resulted from and resulted in a greater amount of professional and national pride in the navies. In a time of war this may lead to a less cohesive Warsaw Pact Baltic Fleet than the Soviet Union would like.

A. THE EAST GERMAN CONTRIBUTION

The East German Navy is approximately as large as the West German and Danish navies combined. The East German Navy, however, has no fixed-wing aircraft or submarine assets. As of 1983, the East German Navy consisted of more than 140 combatants and about sixty auxiliaries and surface craft. In addition, the Coast Border Brigade, subordinate to the Ministry of the Interior, operates approximately forty patrol craft and boats.

The peacetime missions of the East German Navy include coastal surveillance, joint operations with the Soviet Baltic Fleet and the Polish Navy, and intelligence gathering in the

western Baltic. In the event of war, the East German Navy is expected to counter West German forces in the Baltic, provide amphibious lift for Warsaw Pact forces, support the maritime flank of the Warsaw Pact ground forces, defend sea lines of communication, and provide bases and logistic support for Warsaw Pact forces in East German waters.

As the result of a modernization program begun in 1960, the East German Navy has gone from a purely coastal defense force into one capable of undertaking offensive missions in the western Baltic and beyond. The East German Navy's largest combatants are two "Koni" class frigates acquired from the Soviet Union in 1979 and 1980. It has been reported that two more of this class will be delivered by the Soviet Union in the near future.[2]

Another upgrading of the East German Navy has been the construction of the new 1,200 ton, Parchim class ASW corvettes at Peineweift Shipyard in Wolgart. The first Parchim was commissioned on 9 April 1981.[3] As of now, nine are in service with a tenth Parchim commissioned and being fitted out. Two more ships, probably the last of the series are nearing completion. These ships are capable of attaining a speed of 25 knots and strongly resemble the Soviet Grisha class corvettes. The Parchim class carries a relatively large amount of armament for a ship of its size. The main armament are four torpedo tubes and four 16-inch ASW rocket launchers. For air defense it carries two 57 mm and two

30 mm dual purpose guns as well as SAN-5 "Grail" heat seeking missiles. The Parchim is equipped with a dipping sonar amidships and it is capable of laying mines and depth charges. However, the ship must stop in order to lower the sonar's transducer and conduct a search.[4] These ships are quantum leap for the East German Navy over the obsolescent Hai-III class.

The amphibious component of the East German Navy is made up of ten 2,000 Frosch-I class landing ships (LSTs) and two Frosch-II (LST/AGPs); all of which entered service between 1976 and 1980. This almost doubled the lift capacity of the East German Navy.

The mine countermeasures force of the East German Navy presently consists of forty active ships and of these, thirty-one are coastal minesweepers of the Kondor-II class. A total of nineteen Kondor-I class minesweepers are presently employed by the Coastal Border Brigade. Six additional Kondor-Is are employed as intelligence collectors and torpedo recovery ships.[5]

By the end of the 1970's as Warsaw Pact naval exercise areas include the North and Norwegian Seas, it became obvious that East German naval vessels lacked adequate logistical support for operations on the high seas. Therefore in 1981, two Frosch-Is were modified to serve as "high sea combat supply ships". In 1982 the construction of a new Darass class of "high seas combat supply ship" was

begun and then commissioned in the spring of 1983. The 1,200 ton Darass is powered by a single shaft 1.600 - 2,000 horsepower diesel engine plant fitted with a variable pitch propeller, which allows a maximum speed of 14-15 knots. The ship can carry 650 tons of dry cargo and 200 tons of fuel. The replenishment of dry cargo cannot be carried out while the ship is under way. While not a state-of-the-art ship, the Darass will further enhance the capability of the East German Navy to conduct sustained operations within the Baltic and beyond--should changing Warsaw Pact requirements make it necessary.

The most urgent task facing the East German Navy is the replacement of its fifteen aging OSA-Is and eighteen Sherchens. There are indications that the OSA-Is may be updated to receive surface-to-surface missile (SS-N-2C). Both of these classes may be replaced by the new Soviet Tarantual class over the next decade. In addition to the eighteen Sherchens, the East German Navy has thirty-one domestically produced 30 tons, 40 knots Libelle class fast attack craft. The Libelle are apparently intended for defending naval bases and approaches. These small craft can also be used for minelaying and transporting frogman/commando teams. Their small size and correspondingly poor sea keeping ability restrict their employment to relatively good weather conditions.[6]

The naval air arm consists of only eight Mi-14 land-based ASW helicopters and has remained at that level of technology and size for a decade. Presently the East German Navy has no shipboard air capability. It is possible that this will be addressed as modernization continues.

All of the combatants, except for thirty-eight ex-Soviet vessels, were built in East Germany and approximately 75% of them entered service within the last ten years. Between 1978 and 1983, some sixty-two have been either decommissioned or scrapped but the total number of ships has actually slightly risen. (See Appendix D.)

The East German Navy is overall a modern force large enough on its own to threaten NATO forces. However, it has an ally to the east with a navy about as large as East Germany's navy and with capabilities, such as submarines, which the East German Navy does not have. This ally is Poland and is the next topic of discussion.

B. THE POLISH CONTRIBUTION

The Polish Navy is roughly equal to the East German Navy in size. Its numerical strength peaked about 1970, after which the older vessels acquired from the Soviet Union were phased out. Major surface combatants almost disappeared after 1970. Since 1975, the only destroyer in the Polish Navy has been the Warszawa, SAM Kotlin class. Major combatants are not required in the Polish Navy to accomplish

the missions assigned to it by the Warsaw Pact since these missions would occur within the Baltic Sea. Instead, the Polish Navy has spent a large percentage of its budget to build amphibious ships. The Polish Navy is comprised of approximately 110 combatants and fifty small auxiliaries and service craft. This force is supplemented by thirty patrol boats belonging to the border guard. In the last five years only two ships have been added to the fleet, fiberglass hulled, Notec class, coastal minesweepers. The backbone of the Polish Navy's offensive strength consists of four Whiskey class patrol submarines, the one SAM Kotlin guided missile destroyer already mentioned, thirteen OSA-Is, and ten Wilsa class patrol boats. The naval air arm is reportedly made up of forty aging MiG-17 fighter-bombers; ten even older Il-38, Beagle bombers; and about twenty-five equally ancient Mi-4, Hound helicopters.[7]

The principal peacetime missions of the Polish Navy are the surveillance of the coast, participation in Warsaw Pact exercises, and intelligence-gathering missions in the Baltic and its approaches. Polish ships conduct frequent circumnavigations of the Danish island of Zealand and the island of Bornholm.[8] Its major wartime missions would be to conduct joint operations with the Soviet Baltic Fleet and the West German Navy, to augment the amphibious lift capability of the other Warsaw Pact forces, to support the maritime flanks of the ground forces, and to defend the Polish coast.[9]

The Polish Navy has several serious shortcomings. The Whiskey class submarines, even though they are maintained in excellent operating condition, are essentially obsolete. They are all at least 15 years old. The ASW capability of Poland, unlike the East German Navy, is negligible. It rests largely in eighteen, 25 years old patrol craft equipped only with depth-charge rails and twelve domestically produced Orlik class ocean minesweepers. The Orlik minesweepers are all at least 15 years old and have no capability to detect and sweep modern mines. The replacement rate is one Notec class every two years, which is not an adequate replacement rate. The OSA-I class guided missile fast attack craft which were transferred from the Soviet Union during the period 1963 to 1965 are obsolete. The brightest spot in the Polish Navy is its amphibious lift capability. With its twenty-three 850 ton Polnocny class landing ships (LSMs), four Marabut class landing craft (LCM's), and fifteen Eichenstaden assault landing craft (LCAs), the Polish Navy possesses a relatively large lift capability. However, some of these ships have also seen their twentieth birthdays. The Polish Navy inventory no longer lists any ships for under way replenishment and a total of only fourteen auxiliary and fleet support vessels.

The Polish Fleet is clearly a rapidly aging force since most of the ships in service were built in the mid 1960's or earlier. Poland's seemingly hopeless economic situation will

prevent, at least for the next few years, any large scale construction program to replace surface combatants and submarines. In addition, the highly unstable internal political situation makes the prospect of acquiring any additional ships from the Soviet Union extremely dim. It would not make sense for the Soviet Union to arm the navy of a country which they might one day "occupy." (See Appendix E for the Polish Naval Force Levels.)

Evidence that the Polish Navy is experiencing some problems with morale and discipline, especially in the lower ranks appeared in August of 1982. It was reported that three seamen were accused of criminal acts of "printing and distributing leaflets with hostile characters." They were apparently members of the then outlawed Solidarity union and summarily received jail sentences.[10]

Both the Polish Navy and the East German Navy are of respectable size; though they may have weaknesses, they each represent a significant threat. Both of these two "little brother" navies of the Warsaw Pact Baltic Fleet are dwarfed in size and capabilities by the Twice Red Banner Baltic Fleet of the Soviet Union. (See Appendix F for a comparison.)

C. THE SOVIET CONTRIBUTION

Although data for the Soviet Baltic Fleet has been released by D. I. A. for only the last six years, it can be

seen that the number of ships in all the different kinds of naval combat categories have been declining through out this period. However, the Soviet Baltic Fleet still remains larger than any other navy in the Baltic region. Its principal surface combatants include two cruisers, four gun-equipped destroyers, a five guided missile destroyers, and six guided missile-equipped frigates, and 25 gun-equipped frigates and corvettes.[11] (See Appendix G for details of the forces structure.) The reduction in the number of principal surface combatants has largely been due to the retirement of older units without replacement. Most of the minor surface combatants are smaller patrol craft designed for the defense of the Soviet coastline. The large force of guided missile boats which were acquired in the 1960s for anti-ship operations has maintained and even grown slightly. Mine warfare assets have also declined somewhat during the last nine years but have been modernized to maintain or even increase their capability. The Soviet submarine force was and is composed overwhelmingly of aging conventional attack submarines, primarily members of the Foxtrot, Quebec, and Whiskey classes. The Soviet Baltic Fleet currently has five cruise missile attack submarines, but these too are aging.

In 1976, six conventionally powered ballistic missile submarines of the Golf class were transferred from the Northern Fleet. The transfer from the Northern Fleet brought a new, nuclear capability to the area. These submarines were

constructed from 1958 to 1962 and were the first Russian submarines to carry ballistic missiles with a range of up to 600 nautical miles.[12] The missiles on board the Golf class submarines were not counted in the SALT I agreement due to their old age and relatively short range. When compared to the already large, land-based, intermediate range missile capability of the Soviet Union in this area, these missiles are not very significant. However, as a psychological weapon against the people of Europe and NATO planners, the missiles represent an additional threat.[13]

The reduction in the size of the submarine force has mainly been due to the retirement of ships as they reach the end of their hull life. Despite the decline in number, the Soviet Baltic Fleet's forces remain far in excess of what NATO can mount. As far as total numbers are concerned, the Soviet Baltic Fleet is almost twice as large as the navies of Denmark and West Germany combined. Appendix H presents the combat assets available to the Soviet Baltic Fleet in comparision to the remaining three Soviet fleets.

The reconnaissance, the anti-submarine warfare (ASW), and transport elements are organized into independent regiments and squadrons. The Badger strike regiment fly Badger C and G versions and have a headquarter element and two squadrons of twelve aircraft equipped with one of the strike models; the third squadron of the regiment flies a mixture of Badger A tankers and Badger H/J electronic countermeasures (ECM)

support aircraft. The Backfire B strike regiments have two squadrons flying twelve aircraft each. Reconnaissance and ECM versions of the Backfire B are expected within a few years. The Blinder A strike regiments also have two squadrons but with the addition of two or three Blinder C reconnaissance variants per regiment.[14] The May ASW squadron of twelve aircraft in the Baltic is reported to have organizational ties with the Northern Fleet Regiment. The Mail ASW regiment is made up of two squadrons each flying twelve amphibians. The Haze A and Hormone A ASW helicopter regiments are presumed to have twenty helicopters each. It should be noted that there is a lack of reconnaissance aircraft in the Baltic Fleet. This is explained by the fact that the Baltic borders on the Soviet Union and two other Warsaw Pact nations which are able to provide intelligence and support facilities to Soviet aircraft to negate this requirement.

Over the last twenty years there have been definite changes in the sizes and more importantly, capabilities of the Warsaw Pact Baltic Fleet. The next section examines the two most important trends.

D. WARSAW PACT NAVAL TRENDS

There are two Warsaw Pact capabilities which deserve special attention since they were specifically developed in support of critical maritime missions of the Warsaw Pact

Baltic Fleet. The first is the creation and development of amphibious assault assets in the East German and Polish navies. Twenty-five years ago neither nation's military had an amphibious capability. Both nations began to acquire or build LST's and LSM's in the early 1960's. During most of the period from 1965 to 1980, this process was dominated by the Polish Navy. (See Appendices D and E.) Poland not only possessed more amphibious landing forces, but also a large and capable ship-building industry which began to produce new classes of LSTs and LSMs such as the Polnocny and Ropucha in the mid-1960's. Since 1975, East Germany increased the size of its amphibious forces and began producing its own indigenously designed Frosch-I,II class LSMs and LSTs. The East German Navy is now reported to have adequate amphibious lift capability to transport the Army's 29th Motorized Rifle Regiment. The Polish Navy does not have sufficient dedicated assets to simultaneously lift all of its forces. However, (as the British Falkland Islands operations showed) much can be done to alleviate this by the use of requisitioned merchant vessels which include sophisticated Roll-on/Roll-off (RO/RO) designs in the Polish Merchant Marine. As a result, the amphibious capabilities of the two nations have continued to grow.

The second specialized naval capability of the Warsaw Pact Baltic Fleet is the progressive build-up in anti-ship attack power, which is reflected in the growth of the Warsaw

Pact missile threat at sea. Since the mid 1960's the East German and Polish Navies have acquired guided missiles patrol boats. Over the last six years the number of cruise missile-equipped submarines has gone from two to five. The bulk of the Warsaw Pact anti-ship threat at sea remains in the Soviet Baltic Fleet. Throughout the last twenty years Soviet medium bombers (Badgers and Blinders) equipped with air-to-surface missiles have been the most important single item. Growth and modernization occurred in the last ten years through the incorporation of the advanced Backfire B and the Fitter C/D into the Soviet Baltic Fleet. Surface vessels equipped with anti-ship missiles are also increasing as more and more of the aging frigates and destroyers are replaced by missile equipped patrol craft and fast attack craft.

Over the last twenty years the Warsaw Pact Baltic Fleet has greatly increased its anti-ship missile and amphibious capabilities in the Baltic Sea. These capabilities have been developed specifically to support the missions of the Warsaw Pact Baltic Fleet.

FOOTNOTES

[1]Thomas M. Forster, The East German Army, translated by Deruck Viney, (Boston: George Allen and Unwin Ltd., 1980), 1980, p. 84.

[2]Milan Vego, "East European Navies," U. S. Naval Institute Proceedings, March 1984, p. 44.

[3]Milan Vego, "East European Navies," U. S. Naval Institute Proceedings, March 1981, p. 35.

[4]G. Randall Gray, ed., Conway's All the Worlds Fighting Ships 1947-1982 Par II: The Warsaw Pact and Non-Aligned Nations, (Annapolis: Naval Institute Press. 1983), p. 45.

[5]Milan Vego, "East European Navies," U. S. Naval Institute Proceedings, March 1984, p. 44.

[6]Ibid.

[7]J. John Moore, ed., Jane's Fighting Ships 1983-1984, (London: Jane's Publishing Company Ltd., 1983), p. 386.

[8]"Soviets' Buildup in North Exceeds Protection Level," Aviation Week and Space Technology, 15 June 1981, p. 107.

[9]Milan Vego, "East European Navies," U. S. Naval Institute Proceedings, March 1981, p. 35.

[10]Milan Vego, "East European Navies," U. S. Naval Institute Proceedings, March 1983, p. 43.

[11]N. Moore, Jane's Fighting Ships 1983-1984, p. 386.

[12]Randall Gray, ed., Conway's All the World's Fighting Ships 1947-1982 Part II: The Warsaw Pact and Non-aligned Nations, p. 494-495.

[13]N. Moore, Jane's Fighting Ships 1983-1984, p. 386.

[14]"Soviet Military Power - Part I: Navy and Air Force," Jane's Defense Review, January 1982, p. 24.

VI. THE NATO OPPOSITION

The underlying principle of the Atlantic Alliance is stated in Article Five of the North Atlantic Treaty--"... an armed attack against one shall be considered an attack against all." It is here that the deterrence strategy of NATO begins. While the Warsaw Pact might be willing to assume the risks of a localized attack on a non-allied nation, it has so far been unwilling to test the combined strength of the Alliance.[1]

NATO naval and naval air forces must accomplish five major tasks in the event of conflict in the Baltic region:

1. To degrade the offensive capabilities of the Warsaw Pact forces in the Baltic.
2. To impede the use of the Baltic by the Warsaw Pact forces.
3. To contain the Warsaw Pact forces.
4. To repel attacks upon friendly coasts.
5. To deny the use of the Danish Straits to the Warsaw Pact forces.

Considering the large numerical advantage of the Warsaw Pact forces in the Baltic region, NATO faces an extremely difficult challenge if it intends to carry out these tasks in war or use them as a credible deterrent in peace.[2]

The navies of Denmark and the Federal Republic of Germany (West Germany) are tasked by NATO to protect the maritime flanks of the NATO land front in the Baltic, and Baltic approaches. The defense forces of the two countries share training and equipment. Both navies have continued to update their communications systems and to keep abreast of mine countermeasures. The Danish Navy has 4,579 officers and men in uniform, plus 1,268 national service ratings. The West German Navy, with 38,500 personnel, has responsibilities in the Atlantic Ocean, the North Sea, and Norwegian Seas in addition to the Baltic.[3]

Both navies have tended to have a relatively constant overall force structure. Since most ships serve more than 20 years changes in force structure will be a gradual process. This tendency is reinforced by factors such as limited financial resources, conservative naval leadership which is resistant to change, and, in case of these two NATO countries, a relative continuity in missions since NATO has been in existence. The replacement programs of Denmark and West Germany are designed to maintain the current force levels while improving technology and capability.

The past few years have been one of conflicting pressures on Western European navies. Defense budgets have been under severe strain because of poor economic conditions and because of the anti-defense sentiment caused by the nuclear issue. On the opposing side, however, was the growing Soviet naval

threat (dramatized in 1981-82 by a rash of submarine incursions into the territorial waters of European countries) and an increasing awareness that navies served not only NATO needs but national needs as well. The Falkland Island War was a perfect example of this. Even West Germany could make use of a navy if for example, a disagreement arose concerning continental shelf rights under the Baltic Sea.

Denmark has stated that Soviet aircraft are violating Danish air space at least once a month. Additionally, the Soviet have set up permanent patrols around the Zealand Island group and routinely fly reconnaissance aircraft off Bornholm.[4] [Ref. Fig. 3]

Both Denmark and West Germany have developed a range of naval capabilities for the wartime objectives of controlling the western Baltic Sea and the Danish Straits, and of resisting amphibious attacks upon their territories by Warsaw Pact forces. The Baltic Sea capabilities are based upon several different kinds of missions and vessels, including destroyers, frigates, fast attack craft, mine warfare craft, submarines, and anti-ship fighter aircraft. Both the Danish and West German navies play key roles in the NATO defense in the Baltic, although West German naval forces are considerably larger and more diversified in their composition and response to the Warsaw Pact naval threat.

A. THE WEST GERMAN CONTRIBUTION

West Germany is concerned by the threat posed by Warsaw Pact forces but for a more immediate reason than its allies. One-third of the inhabitants and one-fourth of the industrial capacity of West Germany are within 100 kilometers of the Warsaw Pact border.[5]

In 1980, West Germany lifted a self-imposed restriction on operating north of 61° North latitude and the post World War II restriction limiting the tonnage of vessels constructed in German shipyards expired. These restrictions were placed upon West Germany as a condition of being admitted to the West European Union. Submarines were limited to the size of 1,800 tons and had to be conventionally powered. The tonnage of surface combatants could not exceed 3,000 tons, and no ship could be nuclear armed. The West European Union lifted these restrictions on 21 July 1981 with the approval of General William R. Rogers, the commander of Allied forces in Europe.[6] This has resulted in an expansion of the operating area of the West German Navy which now also operates in the northeastern Atlantic assisting in sea control operation in the Greenland Iceland-UK gap area, as other allies move commitments to other areas, i.e. the Indian Ocean.[7]

The West German Navy maintains sizable forces in the destroyer/frigate, fast attack craft, submarine, and mine warfare categories. It is currently updating the

destroyer/frigate and fast attack craft categories and programs are being proposed to update the last two. An examination of these programs should convey a sense of the direction on which the West German Navy is embarking.

The lead ship of the German version of the "NATO standard frigate," Bremen was commissioned in May 1981 and now two more sister ships of this class have joined the fleet. The West German Navy had originally planned to build twelve of this class, but cost overruns and other financial problem will prevent the construction of any ships beyond the six already commissioned. Instead the three Lutjens class are being modernized and there are plans for updating the four Hamburg class destroyers.[8]

The West German Navy has also received four of ten new fast attack craft, the Type-143A class. This is the same as the already existing Type-143 class except for a point defense missile system which has replaced a dual purpose 76 mm gun on the earlier version. These ships are replacing the ten Zobel class on a one-for-one basis keeping the force level constant.[9]

The next area in which the West German Navy is likely to modernize is their submarine force which is between eleven and twenty years old. The replacement submarine is expected to be the Type-208 class which the West Germans are developing with the Norwegians. This class is supposed to have an air-independent fuel system (probably a fuel cell).[10]

Beginning in 1987, ten Type-343 class mine combatants are to be phased into the fleet, again on a one-for-one basis, maintaining a constant force level. In 1991, 20 Type-332 class minesweepers will begin replacing the Lindau class. Six minesweepers have been converted to operate the Troika anti-mine drone in the last four years.[11] (For a table of the force levels and components of the West German Fleet, see Appendix I.)

The West German Navy consist of seven of the Z class destroyers, seven frigates (including three of the Bremen class, six missile-equipped corvettes, thirty-four missile-equipped fast attack craft, including four of the Type 143A class, five torpedo equipped fast attack craft, twenty-four submarines and fifty-nine mine countermeasures craft.[12]

In addition the West German Navy has a significant air arm made up of 6,700 men. The Naval Air Division is now being modernized with Panavia-built Tornado fighter-bomber. When the changeover is complete in 1987, the Navy should have 112 Tornados. The Tornado is an all-weather, multi-purpose aircraft equipped with defense suppression aids, terrain-following radar, and the Kormoran air-to-surface missile. The Tornado is replacing the aging and less capable F-104G, Starfighter, though it is not yet known if a modified Tornado will replace the reconnaissance version of the Starfighter RF-104G).[13] The Naval Air Division also operates nineteen

Atlantic maritime patrol aircraft. Five of these aircraft have been converted to electronic warfare aircraft. By the middle of 1983, the remaining fourteen aircraft had completed a modernization program by Dornier.[14] Twenty-two search-and-rescue Sea King helicopters are scheduled to be replaced by the end of the decade by the Naval Helicopter 90, a standardized helicopter for attack, anti-submarine warfare, search and rescue, and logistics.[15]

The West German Navy's missions are fully integrated with NATO's missions. All German naval units are organized to conform to NATO-wide task organization principles and naval messages and orders are transmitted in English.[16] In addition to the new area of responsibility which the German Navy has assumed in the Greenland-Ireland-UK gap area, there are two other principal operating areas, the North Sea and the Baltic Sea and its approaches. The mission in the North Sea is to protect sea lines of communication from England and the United States to Europe, as well as port facilities, and to halt any Warsaw Pact advances in the North Sea. The mission in the Baltic Sea and the Baltic approaches is to protect the flanks of the NATO land fronts to the north and south. The West German Navy's area of responsibility within the Baltic Sea is from the Kattegat to west of the Danish island of Bornholm. This is an area with many islands and islets which places a great emphasis on maneuverability. The West German Navy's response to the problem of operating in

this area is a mobile, flexible defense force made up of many small units, i.e., missile-equipped fast attack craft with fast minelayers and aircraft.[17]

Mine countermeasures vessels are designed to protect shallow waters against enemy mines. Defensive minelaying will be done in order to prevent hostile shipping from passing through to the Danish Straits, and to hinder hostile amphibious landing operations.[18]

The operations in the Atlantic may lead to a larger navy but this will be a gradual process due to the depressed West German economic situation. Summing up, the West German Navy operating under fiscal and physical restraints, as well as the defensive restraints placed on it by NATO doctrine, has managed to maintain a modern, varied defense force.

B. THE DANISH CONTRIBUTION

The size of the Danish Navy has remained almost constant for the last twenty years. This may change over the next few years largely due to political and economic factors. The Radical Party which is anti-NATO and anti-defense expenditures, is one of the four parties in the minority government and cannot be expected to support increased defense expenditures. The previous government was forced to step down in 1982 after less than two years in office due to a withdrawal of Radical Party support.

There are several major problems with the Danish economic situation which are common to "welfare" countries. The budget is unbalanced, largely due to an extremely high standard of social welfare. With a high and increasing unemployment rate, which exceeded ten percent of the labor force in November 1982, the payment of social benefits has been a constantly increasing burden. Interest rates have been high since deficit spending is covered by loans. Taxation is very high for the self-employed, businesses, and industry. This places Danish industry at a disadvantage in international trading. Almost all raw materials and energy sources must be imported making Denmark particularly vulnerable to an oil crisis, etc. The current government economic policy is based upon a reduction of governmental spending in both defense and social welfare sectors. The Danish Navy, therefore, has little real prospect of seeing its budget increase while the country is faced with such fiscal problems.[19]

Denmark's four year Defense Settlement for 1981-1985 was put into effect by the legislature in mid-1981. The main procurement program called for the construction of three submarines of either the West German Type-209 or the Swedish A-17 class.[20] As of now no decision has been made. The three remaining Delfinens were built in 1958-1959 and 1964, while the two Type-205s were built in 1970. All of the ships are

reaching the end of their hull lives, and their active and passive sonar have become obsolete.[21]

There are plans for the acquisition of four shore-based helicopter for anti-submarine warfare. The Naval air arms consists of eight Lynx helicopters but all maintenance and service is done by the Air Force. The Air Force also flies three Gulf Stream aircraft as long range maritime patrol units.[22]

The two Peder Skeram class frigates completed mid-life modernization in 1982. The major external change was the addition of a Sea Sparrow surface-to-air missile launcher. Three Nils Juel class frigates were added to the fleet in 1980-82. An additional three were planned but have been cancelled. These modern frigates are equipped with guns, surface-to-surface missiles, and are scheduled to be fitted with the General Dynamics RAM point-defense, surface-to-air missiles.[23] The ten missile-equipped Willemies fast attack craft were commissioned between 1976-78. Four of the six Soloven class torpedo boats are scheduled to be fitted with surface-to-surface missiles between 1912 and 1985.[24] This program has yet to begin.[25] The Defense Settlement, mentioned earlier also scheduled two of these for deletion without replacement.[26]

The mine countermeasures forces consist of seven minelayers and eight coastal minesweepers. The Defense Settlement also called for the deletion without replacement

of one minelayer and two coastal minesweepers. [27] (For a table of the force levels and components of the Danish Navy for the past twenty years see Appendix J.)

Neither the two Solovan class torpedo boats nor the three mine countermeasures craft scheduled to be deleted by the Defense Settlement have been removed from active duty. The Navy has retained them in order to maintain the force levels and in hopes that money will be forthcoming for replacement.[28]

The Danish Navy clearly has a difficult problem facing it within a few years. Its ships, especially its submarines, are becoming obsolescent; and the poor Danish economy, unless there is a definite change, is in no position to help.

The mission of the Danish Navy is to control the Danish Straits. This includes the Zealand island group and Bornholm Island. In order to accomplish this it must not only prevent the free passage of hostile vessels in a time of war but also protect the Straits themselves from capture.

Denmark is composed of the peninsula of Jutland and about 504 islands. On Jutland, Denmark is generally flat and intensely cultivated. The land is, for the most part, firm and will easily support tracked vehicles.[29] Many of the islands are connected by large, but vulnerable, road and rail bridges. The deduction must be made that Denmark with its long coastline, flat island areas, and many islands, is ideal place for amphibious and commando operations for an

aggressor.[30] It is an equally ideal area in which to conduct quick strikes by fast attack craft and minelaying by a defender. Since the control of the Danish Straits is vital to the accomplishment of the missions of the Warsaw Pact Baltic Fleet, the Straits must logically be the focal point for any Warsaw Pact aggression in the Baltic region.

FOOTNOTES

[1]Ulrich Weisser and Klaus Jancke, "The Problems in the Baltic," NATO's Fifteen Nations, April-May 1978, p. 52.

[2]Ibid., p. 53.

[3]Dora Alves, "Defending the Baltic," Pacific defense review, July 1983, p. 51.

[4]Eugene Kozicharow, "Soviet Buildup in Baltic Troubles Danes," Aviation Week and Space Technology, November 1978, p. 49.

[5]Dora, "The Federal German Navy: Linchpin of the Northern Flank," U. S. Naval Institute Proceeding, June 1981, p. 100.

[6]Dora Alves, "The German Navy Moves Out," U. S. Naval Institute Proceedings, January 1981, p. 96.

[7]Stephan S. Roberts, "Western Europe and NATO Navies," U. S. naval institute proceedings, March 1983, pp. 36-37.

[8]Ibid.

[9]Alves, "The Federal German Navy Moves Out," p. 101.

[10]Norman Friedman, "Western European and NATO Navies," U. S. Naval Institute Proceedings, March 1984, p. 39.

[11]John Moore, ed., Jane's Fighting ships 1983-1984, (London: Jane's Publishing Company Ltd., 1983), p. 187.

[12]Alves, "The Federal German Navy Moves Out," p. 103.

[13]Moore, Jane's Fighting Ships, p. 187.

[14]Alves, "Defending the Baltic," p. 52.

[15]Alves, "The Federal German Navy Moves Out," p. 101.

[16]Ibid., pp. 102-103.

[17]Ibid.

[18]Alves, "Defending the Baltic," pp. 50-51

[19]Roberts, "Western European and NATO Navies," pp. 34-35

[20]Friedman, "Western European and NATO Navies," p. 38.

[21]Moore, Jane's Fighting Ships, p. 117.

[22]Alves, "Defending the Baltic," p. 51.

[23]Ibid.

[24]Moore, Jane's Fighting Ships, p. 117.

[25]Roberts, "Western European and NATO Navies," p. 35.

[26]Henrik B. Konradsen, "Denmark-Key to the Baltic Gate," Military Review, June 1966, pp. 49-50.

[27]Edgar O'ballance, "Defense Problems of Denmark," Military Review, June 1966, p. 25.

VII. CONCLUSIONS

"The Baltic Sea must become a Soviet Sea, and all efforts must be directed toward the attainment of this urgent political directive."[1] . ..Izvestia, 25 December 1918

The Soviet Union has seriously pursued this goal and has achieved a great deal in the intervening 66 years. At the end of World War II, Russia emerged as the dominant power in the Baltic and gained a coastline of about 500 nautical miles under its direct control and another 350 nautical miles under the control of the Warsaw Pact countries, East Germany and Poland. In addition, the 600 nautical miles of Finnish coastline were, at least, neutralized.

The Baltic Sea is important to the Soviet Union for several significant military reasons. Its location provides an avenue of attack to a vulnerable flank from which the Soviet Union can be threatened. Control of the entrance to the Baltic would make it feasible for the Soviet Union to keep any potentially offensive forces out entirely.

The second reason for the Baltic's great importance is the existence of a sizable proportion of the yards, drydock, submarine training facilities, and construction facilities which provide logistical support to the Baltic and Northern Fleets. A sizable portion of the Soviet Navy would be required to intercept NATO cruisers and submarines at a

distance from the Soviet Union, i.e., the Norwegian Sea. In any war lasting more than a few days, the Soviet ships must be provisioned and repaired. Access to the facilities in the Baltic is mandatory. This means control of the Baltic and the Danish Straits is mandatory. Such access is also a necessary preliminary in any attempt by the Warsaw Pact Baltic Fleet to assist the Northern Fleet in operations against the NATO sea lines of communication which would be resupplying NATO forces on the Central and Northern Fronts. The Soviet Northern Fleet, handicapped by ice and a lack of facilities, would have difficulty accomplishing this mission independently in addition to maintaining a barrier against NATO off Norway.

The Baltic Sea is important for another reason; the Baltic forms the northern flank of any Central Front confrontation. By controlling the Baltic, the Warsaw Pact Baltic Fleet would not only secure the northern flank of Warsaw ground forces but also create the possibility of amphibious operations against the NATO flank. Even if an amphibious landing was not carried out, the threat alone is a military asset since NATO would have to divert forces from the Central Front in order to protect its flank. Soviet combatants could also provide for gunfire support mission with the Warsaw Pact forces. Control of the Baltic and the Danish Straits would split NATO's Central Front from its Northern Front in Norway.

It is an established fact that the Soviet Union is, by far, the strongest fleet in the Baltic Sea. The ratio between the Warsaw Pact Baltic Fleet as opposed to the two NATO navies of Denmark and West Germany is almost five to one. Even if the Swedish navy of approximately 150 combatants is added to NATO's strength, the ratio is still four to one.

There are five major categories of Warsaw Pact Baltic Fleet Strength:

1. Approximately thirty-eight submarines, with at least that many more in reserve.
2. A large surface fleet of approximately fifty-four ships, including cruisers, large destroyers, and frigates equipped with surface-to-surface missiles and surface-to-air missiles.
3. Nearly 350 patrol and fast attack craft, most of them equipped with anti-ship missiles.
4. A fairly large amphibious force of sixty-one landing ships, plus many more landing craft. The amphibious force is capable of embarking, at least, one division, plus marine infantry.
5. Naval air arms but only the Soviet's naval aviation is a real threat. The Soviet Baltic Fleet has approximately 120 anti-ship missile equipped bombers, thirty-five maritime patrol aircraft equipped with torpedoes and forty helicopters.

Although the number of ships is certainly impressive, a great many of these ships are not suitable for the special characteristics of and constraints on warfare in the Baltic. Of the submarines, only a few can be used effectively in the shallow Baltic Sea; the others are superfluous. The 400 plus major combatants and patrol craft is too large a number for use in the Baltic only. The larger ships have restrictions placed on their employment by the shallowness of the Baltic and the fact that these ships are too large to hide effectively in the smaller area. The number of patrol craft alone is larger than the entire Danish or West German navies. These smaller ships are much better suited for the quick surprise tactical missions which will characterize operations in the Baltic, but there are still far too many than is required. It must be concluded that these forces must be meant to be utilized outside the Baltic. In all probability these assets will be used in supporting the Northern Fleet in the North and Norwegian Seas, if the Danish Straits can be controlled by Warsaw Pact forces. That this is their intention has been shown repeatedly in Warsaw Pact exercises and has been particularly emphasized in the last five years.

If the Warsaw Pact forces can successfully eliminate NATO minelaying assets and submarines before they can be deployed, the Warsaw Pact Baltic Fleet has a good chance of controlling the Baltic. In order to accomplish this, the Warsaw Pact Baltic Fleet would rely primarily on four items. The first

and foremost is surprise; surprise is one of the basic tenets of Soviet strategy. The remaining items are easier to cope with because they are tangible. They are missile-equipped fast attack craft submarines and anti-ship missile-equipped aircraft. Both of these are areas in which the Warsaw Pact Baltic Fleet, especially its Soviet component, have concentrated. However, in order to ensure that the Baltic Sea remains under its control, the Warsaw Pact Baltic Fleet must control the Danish Straits.

Once the Baltic was secure, or nearly so, the Warsaw Pact Baltic Fleet could aid ground forces with fire support from major combatants, assist in intelligence collection, especially in electronic surveillance, and, of course, amphibious support. Amphibious support is the other major area in which the Warsaw Pact Baltic Fleet has concentrated. This time all three navies built or acquired an increasing number of specialized amphibious vessels. Today one-fifth of the total number of combatants in the Warsaw Pact Baltic Fleet are amphibious ships. (This ratio is constant for all three.)

Three conclusions must be drawn from this thesis. First, the Danish Straits are the key to the Baltic. The Warsaw Pact leaders are well aware of this and simulate seizing the Danish Straits in amphibious exercises. The amphibious units mentioned above would probably first be used in a surprise assault on Denmark. This would probably happen in

conjunction with an airborne operation plus the attack of land forces sweeping through West Germany and into the Jutland peninsula. Quick seizure of the Danish Straits would not only greatly enhance the Warsaw Pact position in the Baltic but would almost guarantee its complete domination of the Baltic. In addition to a major military victory, capturing the Danish Straits might well be a political and psychological victory for the Warsaw Pact. By virtue of its location, Copenhagen might be the first NATO capitol to fall and possibly within the first day of the war.

The second conclusion is that current NATO forces assigned to the Baltic Sea are inadequate to defend the Danish Straits in the event of an attack by the numerically superior Warsaw Pact forces. A surprise strike against the Straits would not leave adequate time for NATO reinforcements to arrive.

The last conclusion is that if the Warsaw Pact forces successfully seize the Danish Straits, the Warsaw Pact Baltic fleet will be able to operate in conjunction with the Northern Fleet in the North and Norwegian Seas and the eastern Atlantic. A captured Denmark could then become a staging base for advances to the north against Norway, south against West Germany, or west against England. Air bases in Denmark could be used to stage strikes against NATO's sea lines of communication, to destroy supplies and reinforcements before they reach Europe, and to prevent

carrier task forces from reaching targets in the Warsaw Pact. The Danish Straits are clearly crucial to NATO's defense. The question then become what measures can be taken and which of these actions are acceptable to the NATO nations.

The most obvious option is for West Germany and Denmark to increase their forces in order to make the cost of taking the Danish Straits prohibitive to the Warsaw Pact. This could be done by increasing air defense forces and modernizing minelaying forces, perhaps even to the extent of aerial minelaying. Aerial mine laying would greatly reduce the warning time and deployment time required to mine the Danish Straits. Unfortunately, such an increase in force levels would require too great an outlay of capital for either government to manage given their currently depressed economics.

Another option would be to insure air superiority through the basing of U. S. aircraft in the area. Two possible countries in which aircraft could be based are Denmark and Norway. Both of these countries have very restrictive basing rights regarding stationing of foreign forces within their borders. It is not politically feasible in either of these countries for their governments to allow an influx of foreign troops. The remaining country in which to base aircraft is West Germany. While this country has certainly become accustomed to foreign forces based within its borders, the problem for Germany is more economical than political. The

basing of aircraft presumes the existence of an air base; in NATO parlance, these air bases are referred to as Collateral Operating Bases. While the exact number of Collateral Operating Bases is classified, it is known that not enough exist to handle the requirements of the planned reinforcements. West Germany has been willing to pay its share in the construction of these bases to say nothing of any additional bases.[2]

A third alternative was recently proposed by Commander Miles Libbey, USN. Commander Libbey recommends that the conventional land attack version of the Tomahawk missile (TLAM-C) be given to NATO countries. This missile has the capability to hit targets 600 to 900 miles away armed with either a 1,000 pound conventional or nuclear warhead. Further, Commander Libbey believes that the missiles should be based on a strike hydrofoil, a somewhat larger ship than the Pegasus class patrol hydrofoil. The ship would carry eight Tomahawk missiles and the Vulcan-Phalanx-20 mm, close-in-weapon-system, for air defense. Such a ship in a high threat area like the Baltic has several positive attributes: maneuverability, speed, and a small radar cross section. It has a great, prohibitive attribute--cost. It is extremely unlikely that any NATO country would be willing to expend the amount of money required to develop and deploy such a ship.[3] A more feasible alternative would be the placing of Tomahawks onboard existing platforms. The cost

then becomes less than a ship's overhaul cost and could easily be done at the same time saving even more money. Vessels equipped with Tomahawks would be able to respond quickly to any aggression and would be able to strike deeply into second and third echelon targets. While such an action on its own would not halt an attack, the devastating response would prevent any rational country from attacking.

Four of the five primary western Soviet airfields, Pechenga, Belusha-Guba, Severomorsk, and the Northern Fleet Headquarters at Murmansk, can be reached with Tomahawk missiles from within the international waters of the Baltic Sea. The Tomahawk missile could reach more than 40 airfields on the Kola Peninsula where more than 700 aircraft are based. Soviet Baltic Fleet Headquarter at Kaliningrad and the naval base on Kotlin Island are also vulnerable to this kind of attack. Many more potential targets could easily be mentioned. Such a strike capability would also greatly ease the burden of carrier task forces which now are tasked with such targets, freeing them for other missions.[4] (See Figure 11 for an idea of the Range and Targets available to Tomahawk missiles.)

The Tomahawk (TLAM) appears to be a means of reducing the numerical imbalance in the Baltic region. This alternative does not have, fiscal, political, or economic drawbacks in any of the recipient NATO nations. The potential problem lies with the United States. There are several major

FIGURE 11

CHART OF TOMAHAWK (TLAM-C) RANGE AND TARGETS

IN THE BALTIC REGION

The 600-nautical mile range of Tomahawk cruise missiles deployed on board strike hydrofoils (SHMs) would force the Soviets to rethink their game plan for naval warfare in Europe. Two fleets of 30 SHMs, stationed on the Baltic and Black seas, would bring no less than 360 warheads to bear on a large chunk of Eastern bloc territory—including some prime military and industrial targets.

Source: Miles A. Libbey III, "The Missing Link," U. S. Naval Institute Proceedings, July 1982, p. 39.

barriers to overcome before the United States would be willing to export the Tomahawk missile. The first is political. After all the debate and difficulty encountered in deploying ground-launched-cruise-missiles (GLCMs) in Europe, the United States might not wish to demonstrate that the cruise missile could have been placed on sea-going platforms instead of being placed on land. The second major obstacle to exporting the Tomahawk to NATO is the technology involved. The digital scene-matching correlator which gives the Tomahawk its amazing accuracy is truly state-of-the-art. Exporting the missile to Europe would increase the likelihood that the technology might find its way to the Soviet Union.

Some analysts have concluded that the Warsaw Pact already controls the Baltic Sea. As Marian K. Leighton wrote, "...the USSR, assisted by its East German and Polish allies, has but all transformed this maritime gateway to Russia into a Communist lake."[5] Clearly, the Warsaw Pact Baltic Fleet has the ability to achieve its missions in a non-nuclear environment if it could obtain the element of surprise. NATO must take some action to reduce the imbalance of forces in the Baltic. If nothing is done then one day the Baltic Sea may truly become a Soviet Sea

FOOTNOTES

[1]Izvestia, 25 December 1918.

[2]Congress of the United States Congressional Budget Office, U. S. Air and Ground Conventional Forces for NATO: Air Defense Issues (Washington D. C.: U. S. Government Printing Office, 1978), p. 26.

[3]Miles Libbey, "The Missing Link," U.S. Naval Institute Proceedings, July 1982, p. 37.

[4]Ibid., p. 41.

[5]Marian K. Leighton, The Soviet Threat to NATO's Northern Flank (New York: National Security Information Center, Inc., 1979), p. 19.

APPENDIX A

SOVIET HIGHER NAVAL SCHOOLS

M. V. Frunze Higher Naval School (Leningrad)

Leningrad Komsomol Higher Naval School for Submarine Navigation (Leningrad)

S. O. Makarov Pacific Ocean Higher Naval School (Vladivostok)

S. M. Korov Caspian Higher Naval School (Baku)

Kaliningrad Higher Naval School (Kaliningrad)

P. S. Nakhimov Black Sea Higher Naval School (Sevastopol)

A. S. Popov Higher Naval School for Radio Electronics (Petrovorets, near Leningrad)

F. E. Dzerzhinsky Higher Naval Engineering School (Leningrad)

V. I. Lenin Higher Naval Engineering School (Leningrad)

Sevastopol Higher Naval Engineering School (Sevastopol)

Source: Guide to the Soviet Navy, Siegfried Breyar and Norman Polmar (Annapolis: Naval Institutes Press, 1977), p. 24.

APPENDIX B

PORT CITIES

Lomonosov, South of Kronstadt on the mainland, is a major base for light naval forces,as well as a commercial and fishing port

Tallin, capital of the Estonian Soviet Socialist Republic, lies west of Oranienbaum at the entrance to the Gulf of Finland. The Tallin naval and commercial ports are ice free most of the year. The northern task force of the Soviet Baltic Fleet is homeported here.

Riga, capital of the Latvian Soviet Socialist Republic, is south of Tallin at the southern end of the Gulf of Riga. There are a large naval base, several major shipyards and a modern commercial port in Riga.

Ventspils lies west of Riga and has several times the cargo handling capability of Riga and an oil facility capable of accommodating supertankers of more than 100,000 deadweight tons.[1]

Klaipeda, capital of the Lithuanian Soviet Socialist Republic lies to the south of Ventspils. This city has commercial and naval harbors as well as a petroleum port. In addition, in 1982 a ferry line began running between Neumulkram, on the East German island of Rugen, and Klaipeda.

These 12,000 ton ferry vessels, ostensibly designed for tourist traffic, are amply capable of the efficient transportation of military cargo and equipment.[2]

Baltiysk lies further south of Klaipeda, almost to the Polish border. Baltiysk is the main base for the southern task force of the Soviet Baltic Fleet. There is a fishing port but few foreign ships put in at Baltiysk. Being so near the Polish border, it also has a flotilla of the Border Patrol of the internal security service.

[1]Siegfried Breyar and Norman Polmar, Guide to the Soviet Navy (Annapolis: Naval Institute Press, 1977), p. 519.

[2]Dora Alves, "Defending the Baltic," Pacific Defense Reporter, July 1983, p. 50.

APPENDIX C

MAJOR SHIPYARDS OF THE SOVIET UNION

Yard	Location	Became Major Yard	Recent Construction*
Admiralty (ex-Marti, ex-Putilov)	Baltic	1900	Submarines (SSN); commercial
Baltic (ex-Ordzhonikidze)	Baltic	1856	Naval (auxiliaries); commercial (inc. nuclear icebreakers)
Kaliningrad	Baltic	1930's	Naval (destroyers [Krivak], escorts, amphibious); commercial
Kanonerskiy	Baltic	1960's	Commercial
Klaipeda	Baltic	1950's	Commercial
Petrovskiy	Baltic	1930's	Naval (small combatants)
Sudomekh	Baltic	1899	Submarines (SSN)
Vyborg	Baltic	1960	Commercial
Zhdanov	Baltic	1930's	Naval (cruisers, destroyers); commercial
Black Sea (ex-Nikolayev Nosenko)	Black	1899	Naval (aircraft and helicopter carriers; auxiliaries); commercial
Kerch (Kamysh-Burun)	Black	1930's	Naval (destroyers [Krivak] small combatants); commercial (inc. supertankers)
Kherson	Black	1950's	Commercial

Yard	Location	Became Major Yard	Recent Construction*
Nikolayev Northern. (61 Kommuna)	Black	1800	Naval (cruisers, destroyers); commercial
Oktyabrskoy	Black	1950's	Commercial
Severodvinsk (ex-Molotovsk)	Arctic	1937-1949	Submarines (SSBN)
Khabarovsk	Pacific	1950's	Naval (escorts, small combatants); commercial
Komsomolsk (Leninskaya Komsomola)	Pacific	1932-	Submarines (SSBN)
Vladivostok	Pacific	1960's	Commercial
Gorkiy (Krasnoye Sormovo)	Inland	1940's	Submarines (SSGN)
Zelenodolsk	Inland	1945-1946	Naval (small combatants, hydrofoils); commercial

*SSBN = nuclear ballistic-missile submarines;
SSN = nuclear torpedo attack submarines;
SSGN = nuclear guided-missile submarines

Source: Guide to the Soviet Navy, Siegfried Breyar and Norman Polmar (Naval Institute Press, 1977), pp. 536 - 537.

APPENDIX D

EAST GERMAN NAVAL FORCE LEVELS: 1964 - 1983

Year	64	65	66	67	68	69	70	71	72	73
FF	4	-	-	-	-	-	-	2	-	-
CR	0	-	-	-	-	-	-	-	-	-
PCL	0	-	-	-	-	-	-	-	-	12
FAC(M)	0	2	-	-	8	12	-	-	-	-
FAC(G/T)	50	-	-	48	50	60	67	62	63	59
LPD, LST, LSM	0	-	-	-	-	-	-	-	-	-
LCT, LCU	18	-	-	-	-	-	-	20	-	-
MSF	22	-	-	-	-	-	16	-	12	10
MSC	37	-	-	-	22	24	29	33	43	-
PC	39	-	-	37	36	24	26	-	-	24
SUPPLY SHIPS	0	-	-	-	-	-	-	-	-	-
SUPPORT TANKERS	0	-	-	-	-	-	-	-	1	2

Year	74	75	76	77	78	79	80	81	82	83
FF	-	-	-	-	1	2	-	-	-	2
CR	-	-	-	-	-	-	-	1	5	9
PCL	16	18	-	-	-	14	-	12	8	9
FAC(M)	-	-	-	15	-	-	12	15	-	15
FAC(G/T)	55	-	58	65	-	61	60	49	-	49
LPD, LST, LSM	-	0	2	5	7	9	12	-	-	12
LCT, LCU	18	16	15	11	9	6	0	-	-	0
MSF	6	3	0	-	-	-	-	-	-	0
MSC	44	54	-	-	-	51	50	33	47	46*
PC	18	-	-	-	-	-	-	0*	-	0
SUPPLY SHIPS	1	4	-	-	-	-	-	-	-	4
SUPPORT TANKERS	3	-	4	-	-	-	-	5	10	10

See Appendix K for abbreviations and "-" means that the number remained the same as the previous year.

*All coastal patrol craft were turned over to the Grenze Brigade Kuste (Border Guard) in 1981. Some coastal mine sweepers are also utilized by the GBK. The GBK had approximately 90 small craft 20 years ago but the number has declined to around 30.

Source: Jane's Fighting Ships (London: Jane's Publishing Company Ltd.), editions 1964 - 1983.

APPENDIX E

POLISH NAVAL FORCE LEVELS: 1964 - 1983

Year	64	65	66	67	68	69	70	71	72	73
SS	7	-	11	-	-	12	6	5	4	-
DD/DDG	5	-	-	-	3	-	-	-	4	-
PCL	8	-	-	-	-	-	-	-	-	-
FAC(M)	12	-	-	-	5	12	-	-	-	-
FAC(G/T)	40	-	-	50	20	-	-	-	-	22
LCT, LST, LSM	7	-	-	-	14	16	-	-	-	20
LCU/LCT	10	-	-	-	-	-	-	12	-	-
MSF	12	-	13	15	21	24	-	-	-	-
MSC	4	-	-	-	-	27**	-	-	-	20
PC	17	-	-	-	36	38	-	-	-	-*
TANKERS	0	-	-	-	-	-	-	-	6	-

Year	74	75	76	77	78	79	80	81	82	83
SS	-	-	-	-	-	-	-	-	-	4
DD/DDG	-	1	-	-	-	-	-	-	-	1
PCL	26*	-	-	-	-	-	25	23	-	18
FAC(M)	-	-	-	-	-	-	13	-	-	13
FAC(G/T)	25	22	18	21	-	-	16	10	-	10
LCT, LST, LSM	23	24	23	-	-	-	-	-	-	23
LCU/LCT	14	15	-	-	-	-	16	19	-	19
MSF	-	-	-	-	-	-	-	-	-	24
MSC	-	-	-	-	-	-	-	25	26	24
PC	20	-	23	33	35	-	41	42	-	45
TANKERS	-	-	-	-	-	8	6	7	-	7

See Appendix K for Abbreviations and "-" means that the number remained the same as the previous year.

* 18 Coastal patrol craft were redesignated as large patrol craft.

** Minesweeping boats began to be counted in the total.

Source: Jane's Fighting Ships (London: Jane's Publishing Company, Ltd.) editions 1964 - 1983.

APPENDIX F

WARSAW PACT NAVAL FORCE LEVELS

	East Germany	Poland	Soviet Union
SSB	0	0	6
SSG	0	0	5
SS	0	4	23
CL	0	0	2
DDG	0	1	4
DD	0	0	4
FFG	0	0	6
FF and FFL	2	18	25
FAC(M) and Missile Corvettes	24	13	55
FAC (G/T)	49	10	120
PC and PCL	9	45	-
MCM	46*	24	125
LPD, LSM, and LST	12	23	26
Total Combatants	142	162	401
Auxiliaries	28	14	144
Total Ships	170	176	545
Naval Aircraft	8**	50/25**	260
Naval Personnel	16,000	22.500	105,000

See Appendix K for abbreviations.

* Some vessels belong to the Grenze Brigade Kuste (GBK)
** Helicopters

Source: Jane's Fighting Ships 1983-84, edited by John Moore (London: Jane's Publishing Company, Ltd., 1983), pp. 181, 396, 486.

APPENDIX G

SOVIET BALTIC FLEET FORCE LEVELS: 1978 - 1983

Year	78	79	80	81	82	83
SSB	6	-	-	-	-	6
SSG	3	2	-	-	4	5
SS	29	51	50	20	34	23+
SSN	0	-	1	0	-	0
CG	2	1	-	-	0	0
CL	2	3	-	2	-	2
DDG	11	5	10	-	4	4++
FF and CR	60	43	-	25	-	25
FAC(M) CR	44	36	-	54	55	55
FAC(G/T) and PC	55	32	45	-	130*	120
MCM	60	65	66	75	125**	125
LPD, LST, LSM	6	10	15	23	25	26
Underway Replenishment Ships	?	?	10	3	-	3
Depot Repair & Support Ships	5	-	-	6	-	5
Support Tankers	?	?	?	5	-	5

See Appendix K for Abbreviations and "-" means that the numbers remained the same as the previous year.

\+ In addition about 85 submarines (SS) are believed to be in reserve.

++ In addition about 13 destroyers are believed to be in reserve.

* Began to include coastal and river patrol craft.

** Began to include coastal and inshore minesweepers.

Source: Jane's Fighting Ships (London: Jane's Publishing Company, Ltd.), editions 1978 - 1983.

APPENDIX H

COMPARISON OF SOVIET FLEET FORCE LEVELS

	Baltic	Northern	Black Sea and Caspian	Pacific
SSB/SSBN	6/0	2/45	-	7/24
SSG/SSGN	5/0	8/28	1/0	4/20
SS/SSN	23/0	55/40	22/0	50/22
CV	-	1	1	1
CHG	-	-	2	-
CG(N)	-	9	9	10
CL	2	2	3	4
DDG	4	15	14	10
DD	4	4	9	8
FFG	6	9	7	10
FF and FFL	25	46	42	50
FAC(M) and Missile Corvettes.	55	30	30	48
FAC(T/G), PC, PCL	120	30	110	140
MCM Forces	125	65	95	105
LPD, LSM, LST	24	13	25	23
Total Combatants	399	402	370	536
Depot Repair and Support Ships	5	29	14	22
Under way Replenishment Ships	3	7	7	11
Support Tankers	5	10	8	7
Hovercraft	24	2	18	16
Total Auxiliary Ships	37	48	47	56
Total Ships	436	450	417	592
Naval Aircraft	260	390	400	430
Personnel Strength	105,000	118,000	99,000	121,000

See Appendix K for Abbreviations.

Source: Jane's Fighting Ships 1983-84, edited by John Moore (London: Jane's Publishing Company, Ltd., 1983), pp. 485, 486.

APPENDIX I

WEST GERMAN NAVAL FORCE LEVELS: 1964 - 1983

Year	64	65	66	67	68	69	70	71	72	73
SS	11	-	-	12	-	-	-	-	-	18
DD/DDG	10	-	-	-	9	11	12	-	11	-
FF/FFL	13	11	-	-	8	-	-	-	-	-
DE	13	-	-	-	-	-	-	-	-	0*
CR	7	-	-	-	6	-	-	-	-	-
FAC(N)	0	-	-	-	-	-	-	-	-	-
FAC(G/T)	49	-	-	47	40	-	-	-	-	-
LCU	7	10	12	29	26	-	24	-	22	-
MSC	57	-	-	58	54	-	-	-	52	62
PC	34	28	26	23	18	-	17	15	13	-
AUXILIARIES	33	34	-	35	40	42	39	-	38	37

Year	74	75	76	77	78	79	80	81	82	83
SS	28	24	-	-	-	-	25	24	-	24
DD/DDG	-	-	-	-	-	-	-	9	7	7
FF/FFL	6	-	-	-	-	-	-	-	7	7
DE	-	-	-	-	-	-	-	-	-	0
CR	-	-	-	-	-	5	6	-	-	6
FAC(N)	12	20	30	-	-	-	-	-	-	34
FAC(G/T)	29	20	10	-	-	-	-	-	-	5
LCU	-	-	-	-	-	-	-	-	-	22
MSC	62	58	-	-	-	59	60	59	-	59
PC	8	-	-	7	-	8	-	-	7	6
AUXILIARIES	36	-	35	33	-	31	30	-	-	29

See Appendix K for Abbreviations and "-" means that the number is the same as the previous year.

* These ships were deleted from the active list in 1973 and were either scrapped or sold.

Source: Jane's Fighting Ships (London: Jane's Publishing Company, Ltd.), editions, 1964 - 1983.

APPENDIX J

DANISH NAVAL FORCE LEVELS: 1964 - 1983

Year	64	65	66	67	68	69	70	71	72	73
SS	-	-	-	-	-	-	-	-	6	-
FF/FFG	5	-	6	-	-	-	-	-	-	-
CR	4	-	-	-	-	-	-	-	-	-
FAC(M)	0	-	-	-	-	-	-	-	-	-
FAC(G/T)	14	13	16	-	-	-	-	-	-	-
PC(L)	11	10	-	9	-	-	-	-	-	22
PC	4	-	-	6	8	9	29	27	26	16
ML	6	8	-	-	-	-	-	7	-	-
MSF/MSC	8	-	-	-	-	-	-	-	-	-
LCU	12	-	10	-	0	-	-	-	-	-

Year	74	75	76	77	78	79	80	81	82	83
SS	-	-	-	-	-	-	-	-	5	5
FF/FFG	-	-	7	-	-	-	9	8	10	10
CR	-	3	-	-	-	2	-	-	0	0
FAC(M)	-	-	4	-	10	-	-	-	-	10
FAC(G/T)	-	10	-	-	6	-	-	-	-	6
PC(L)	-	24	23	-	-	22	-	-	-	22
PC	-	15	-	23	-	8	7	8	-	8
ML	-	5	4	-	7	-	8	7	-	7
MSF/MSC	-	-	-	-	-	-	-	-	7	6
LCU	-	-	-	-	-	-	-	-	-	0

See Appendix K for Abbreviations and "-" means that the number is the same as the previous year.

Source: Jane's Fighting Ships (London: Jane's Publishing Company, Ltd.), editions 1964 - 1983.

APPENDIX K

LIST OF SHIP TYPE ABBREVIATIONS

CG	Guided missile cruiser
CL	Light cruiser
CR	Corvette
DD	Destroyer
DDG	Guided missile destroyer
DE	Destroyer escort
FAC(M)	Fast attack craft (missile)
FAC(G/T)	Fast attack craft (gun/torpedo)
FF	Frigate
FFG	Guided missile frigate
FFL	Light frigate
LCT	Landing craft, tank
LCU	Landing craft
LPD	Amphibious dock
LSM	Amphibious ship, medium
LST	Amphibious ship, tank
MCM	Mine countermeasures craft
ML	Minelayer
MSC	Minesweeper, coastal
MSF	Minesweeper, fleet
SS(N)	Attack submarine (nuclear)
SSG(N)	Anti-ship missile submarine (nuclear)
SSB(N)	Ballistic missile submarine (nuclear)

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